TECHNOLOGY DEPT

THE PAPER INDUSTRY and PAPER WORLD

EDUCATIONAL NEWS MAGAZINE — AUGUST 1946

PUBLIC LIBRARY
DETROIT

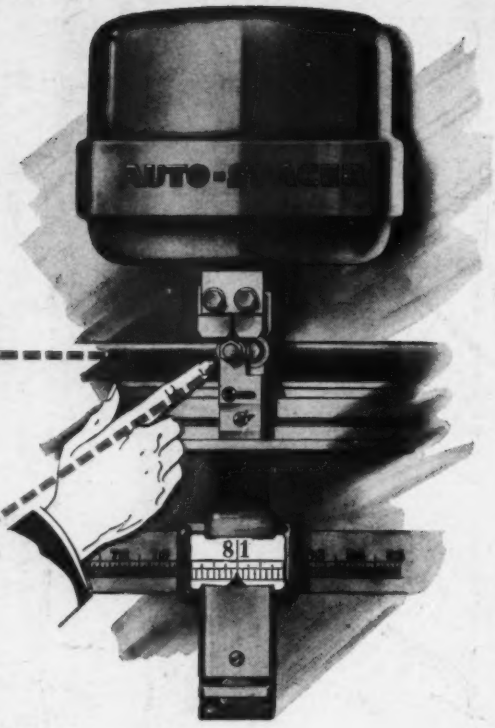
KEEPING PACE WITH EXPANSION DEMAND!

● Patterson Equipment and Patterson Construction Service are at your disposal, to help you build to meet your new market needs.

SATISFACTORY PATTERSON MACHINERY

PATTERSON
MACHINERY

THIS Stop



★ IS BETWEEN THE FINGER AND YOUR PROFITS

Equipment in your shop operates under an overtone of human efficiency. The overtone contains unpredictable loss. You can calculate the output of any machine, theoretically, but the payoff is influenced by the human hand.

Consider for a minute, the Seybold Mill Spacer of the new Sixty Series. The "cut stops" can be set—at one time—to make all the cuts necessary on several jobs. The back gauge automatically moves the stock accurately into cutting position at a faster rate than ever before. Such engineering is the result of Seybold's sixty years' experience with the men who operate cutters and trimmers.

In the tedious job of positioning the paper for one cut after another, the human element takes its toll of your stock and, so, of your profits.

But when the Seybold Mill Spacer permits the operator to make one series of easy adjustments, thus eliminating hours of fatiguing manual labor, that's the result of

ENGINEERING THE HUMAN ELEMENT AT Seybold

HARRIS-SEYBOLD

HARRIS PRESSES • SEYBOLD CUTTERS • OTHER GRAPHIC ARTS EQUIPMENT

HARRIS-SEYBOLD COMPANY — GENERAL OFFICES, CLEVELAND 5, OHIO

ITS

ing is
xperi-
s and

paper
ement
your

r per-
ies of
hours
sult of

d

IENT

Headed for high speed . . .

Enclosed gears for dryer sections, precision-cut for smooth, trouble-free service, are carefully checked and inspected at Beloit Iron Works before installation on high-speed postwar machines. Big, rugged, these gears are designed for flawless performance. They will be helping to turn out paper in busy mills 24 hours a day, seven days a week, year after year. *Beloit Iron Works, Beloit, Wisconsin.*

BELOIT IRON WORKS · PAPER MACHINERY · BELOIT, WIS., U.S.A.

WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE!

BELOIT

PAPER MACHINERY

Part of the Picture of Paper Products

WALDRON MACHINES

COATING EMBOSSING PRINTING SATURATING LAMINATING

WHAT NEXT WILL BE MADE FROM PAPER? That same question was asked when the first paper napkin appeared. It was asked when paper draperies for our living rooms were produced; wall board for building construction; moisture and heat resisting cartons and containers; gleaming table tops made from plastics treated paper.

Just as the famous WALDRON Converting Machines made these and thousands of other products possible in the past, they will continue to transform raw paper stock into newer and better products for the future. Long experience has equipped WALDRON designers and builders to know the trend, to plan the machines for the new processes and products now in the development stage. Witness the recently developed new methods for coating, laminating and impregnating —the direct result of newly designed WALDRON machines.

WHAT NEXT? Watch WALDRON —or better still consult us on your problems or plans.

JOHN WALDRON CORP.

Main Office & Works - NEW BRUNSWICK, NEW JERSEY

CHICAGO - 6
201 N. WELLS ST.

NEW YORK - 17
350 MADISON AVE.

BOSTON - 9
79 MILK ST.

BUILDERS OF QUALITY MACHINES SINCE 1827

In the good old summer time

For millions of Americans, young and old, sunny skies and balmy weather are synonymous with the pleasures of swimming . . . the relaxation of a cooling dip, or the exhilaration of a fast crawl.

Columbia products help to keep swimming the grand care-free recreation it is. Pittchlor* rids captive water of dangerous bacteria, keeps locker rooms, showers and other facilities free of infection . . . just as Pittchlor and Columbia Liquid Chlorine are used to assure pure drinking water for millions *every day*.

*PITTCHLOR—a 70%, high-test calcium hypochlorite of good stability in the form of dry, white granules—is a convenient way to put chlorine to work for disinfecting, deodorizing, sterilizing and bleaching. Used by food plants, dairies, laundries, sewage plants, etc., or wherever the oxidizing power of chlorine is desired.

COLUMBIA CHEMICALS

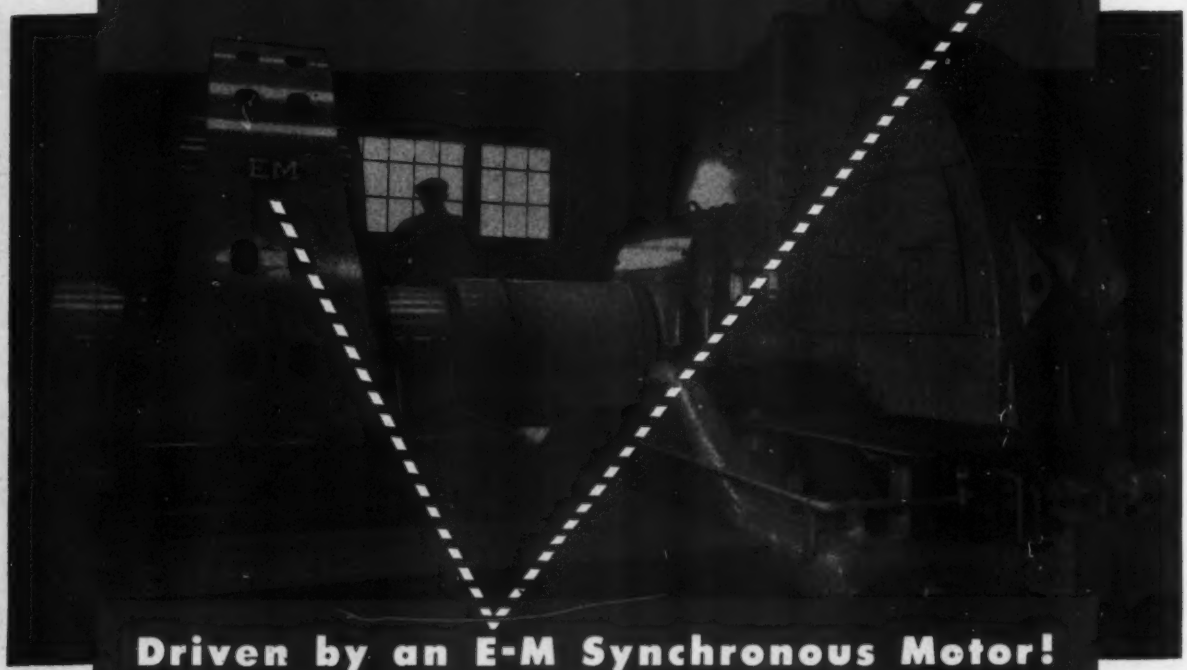
PITTSBURGH PLATE GLASS COMPANY
COLUMBIA CHEMICAL DIVISION

FIFTH AVENUE AT BELLEFIELD, PITTSBURGH 13, PENNA. · Chicago · Boston · St Louis
Pittsburgh · New York · Cincinnati · Cleveland · Philadelphia · Minneapolis · Charlotte · San Francisco

COLUMBIA ESSENTIAL INDUSTRIAL CHEMICALS

Soda Ash · Caustic Soda · Liquid Chlorine · Sodium Bicarbonate · Pittchlor · Silene EF (Hydrated Calcium Silicate) · Calcium Chloride · Soda Briquettes (Iron Desulphurizer) · Modified Sodas · Caustic Ash · Phosflake (Bottle Washer) · Calcene T (Precipitated Calcium Carbonate)

...Paul Bunyan was a piker compared to this chipper



Driven by an E-M Synchronous Motor!

● Even the fabulous strength of Paul Bunyan cannot compare with this chipper that whittles to bits a 38 inch log, 20 feet long, in 15 seconds and can deliver 4 tons of ¾ inch chips in less than a minute.

Driven by an E-M Synchronous Motor, six blades mounted on a whirling 12½ foot disk provide a large west coast pulp mill with the paper industry's highest capacity chipper. Direct-connected and flexibly coupled, the space-saving drive is rated 1500 HP, 277 rpm, 0.8 leading power factor. Utilizing pull-out horsepower of 3750, it maintains continuous production, eliminates log jams.

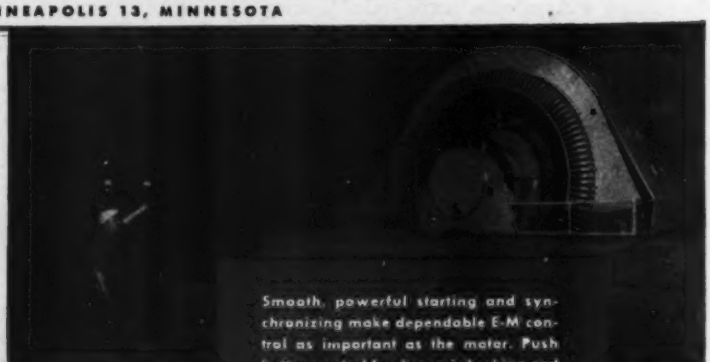
Chipping big logs to bits demands a motor with increased rigidity. E-M engineers, backed by chipper experience, designed this synchronous drive with flared backplate, heavy coil bracing, pedestal and stator foot bolts extending into the foundation, and other sturdy construction features usually found only in the heaviest steel mill motors.

The paper industry, fourth largest user of electrical power, calls on E-M more than any other manufacturer for synchronous motor application to chippers. See the E-M field engineer in your territory for more information about this first-choice heavy duty drive, the E-M Synchronous Motor. Write for your copy of Publication 1067, "Application of Motors to Chippers"

ELECTRIC MACHINERY MANUFACTURING COMPANY
MINNEAPOLIS 13, MINNESOTA

ENGINEERING—MANUFACTURING

EFFICIENT — MODERN



Smooth, powerful starting and synchronizing make dependable E-M control as important as the motor. Push button control for dynamic braking and E-M's Polarized Field Frequency Relay for "conscious control" assure top performance.

A-2031

HEAVY DUTY SYNCHRONOUS MOTOR DRIVES

THE PAPER INDUSTRY and PAPER WORLD

(Reg. U.S. Pat. Off.)

VOLUME 28 **AUGUST, 1946** **NUMBER 5**

—FEATURES—

The Health Program in a Pulp and Paper Mill ..... Hazel H. Leedke 651
New Law Suits Affecting the Paper Industry ..... Leo T. Parker 657
Employee Education in the Paper Industry ..... Walter G. Hendrich 660
Early Papermaking in New York State ..... Harrison Elliott 663
Thermometry—Three Hundred Fifty Years of Progress ..... J. J. Moran 692
Convention Papers . . . Abridged 698

—NEWS—

A Modern Tote-Road 614
Trade Winds 615
Allied 666
Safety 672
Associations 676
Names in the News 680
Personals 680
Necrology 686

—DEPARTMENTS—

Editorial 639
Current Thought 640
Paper Sketches 665
Safety Scores 675
Coming Events 678
Practical Shorts 689
New Equipment and Supplies 724
Technical Developments 728
Papermaking Patents 730
New Publications 732
Current Market Quotations 734
Index to Advertisers 737

Published monthly by **FRITZ PUBLICATIONS, INC., 59 East Van Buren Street, Chicago 5, Illinois**

EDWARD B. FRITZ, Founder
A. SCOTT DOWD, President and Gen. Mgr.
HARRY E. WESTON, Editorial Director
A. C. BRUCE, Secretary
EDGAR C. FARREN, Production Manager
BESSE MERRITHEW, Editor
A. C. FRITZ, Vice Pres. and Treas.
G. E. VON ROSEN, Circulation Director
C. J. ELWELL, Circulation Field Rep.

ADVERTISING REPRESENTATIVES

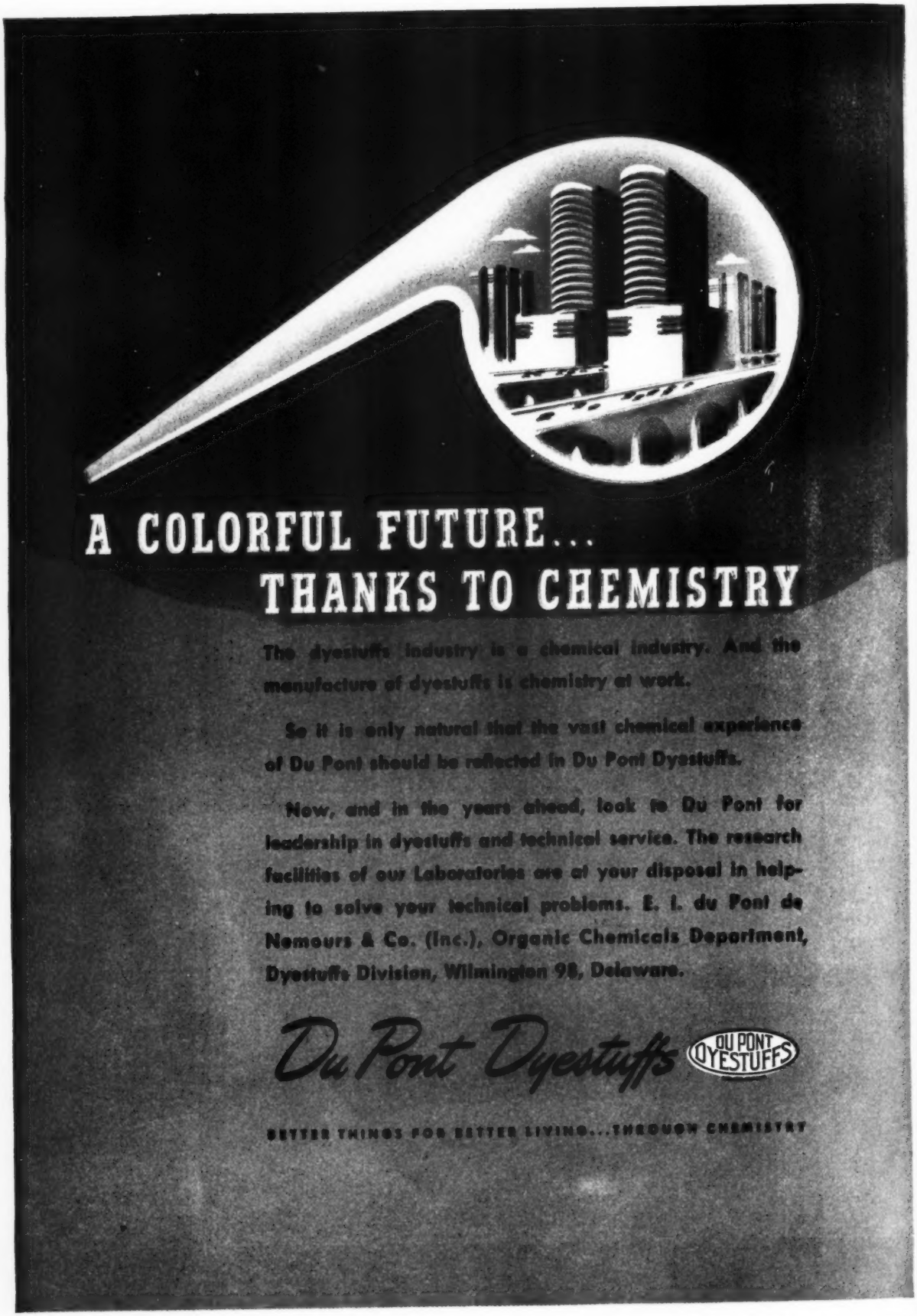
New York • RAYMOND S. VAN NYDECK • 9 Rockefeller Plaza • Circle 7-3085 • New York 20, N. Y.
Boston • MEADE AND COMPANY • 403 Statler Building • Liberty 9677 • Boston 16, Mass.
Cleveland • L. M. PERKINS • 3277 DeSota Ave. • Yellowstone 6504 • Cleveland Heights 18, Ohio
Chicago • JOHN D. HENDERSON • 59 E. Van Buren Street • Wabash 3543 • Chicago 5, Illinois
San Francisco • NOURSE ASSOCIATES • 582 Market Street • Exbrook 7247 • San Francisco 4, Calif.
Los Angeles • NOURSE ASSOCIATES • 412 West 6th Street • Vandike 5875 • Los Angeles 14, Calif.

THE PAPER INDUSTRY and PAPER WORLD is indexed regularly in "The Industrial Arts Index." An index to each volume is issued annually by the publisher as Section Two of the April number.

Copyright 1946 by Fritz Publications, Inc.

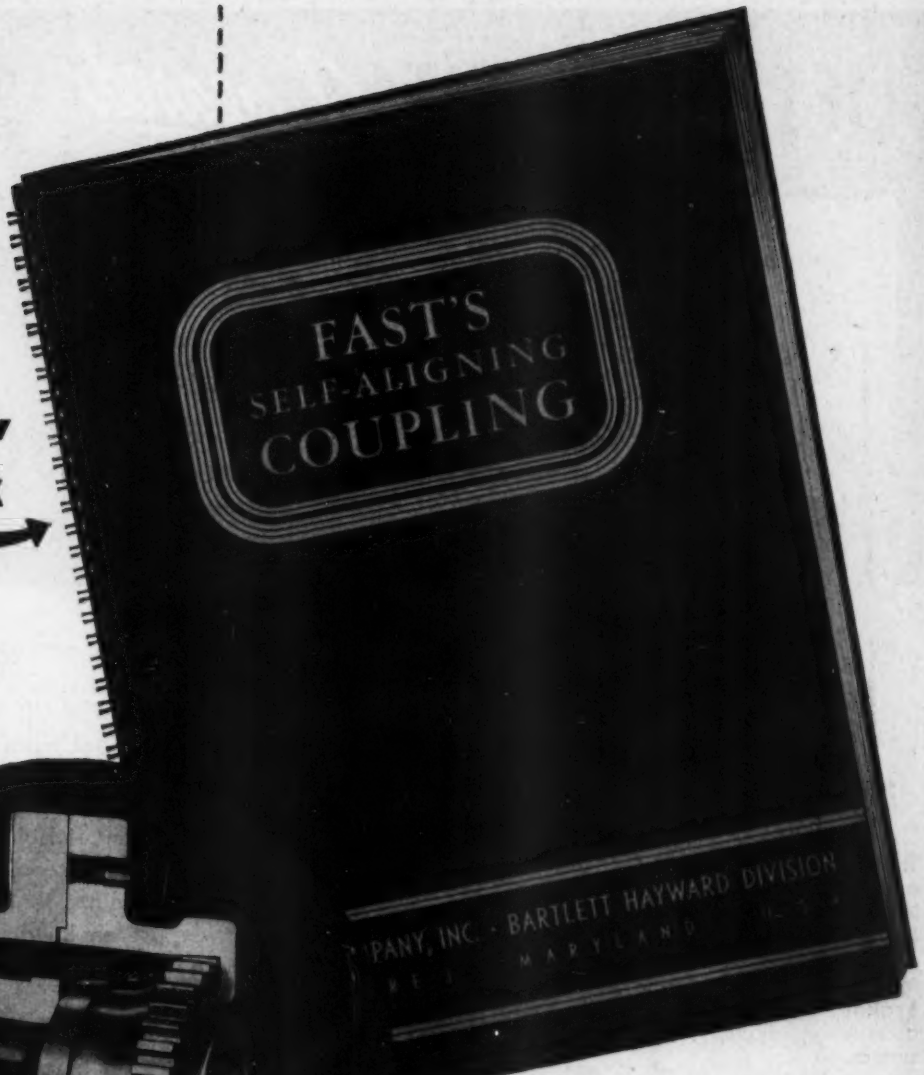
Member:
Audit Bureau of Circulation
Associated Business Papers, Inc.

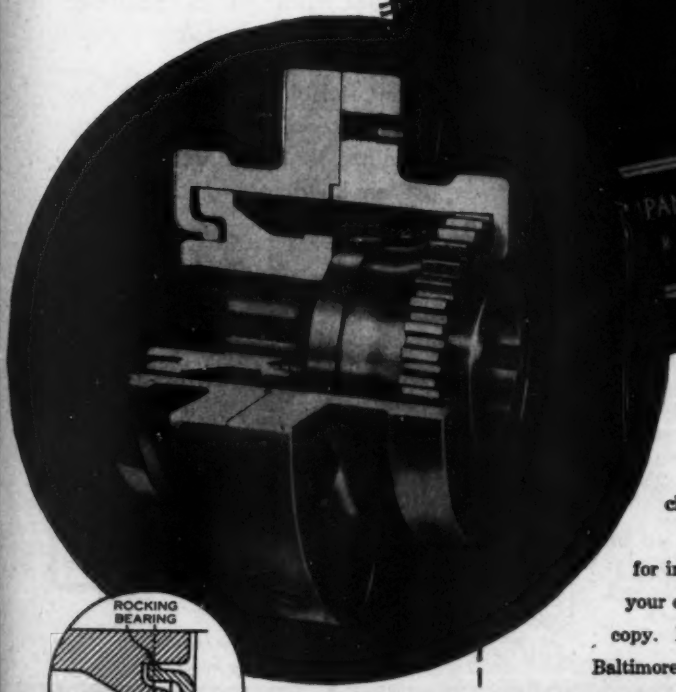
Entered as second class matter June 29, 1938, at the post office at Chicago, Ill., under the Act of March 3, 1879. Subscriptions in the United States, U. S. Possessions, Canada, Cuba and Mexico, $2.00 for one year, $3.00 for two years. All other countries $3.00 for one year, $5.00 for two years.


A COLORFUL FUTURE...
THANKS TO CHEMISTRY
The dyestuffs industry is a chemical industry. And the manufacture of dyestuffs is chemistry at work.
So it is only natural that the vast chemical experience of Du Pont should be reflected in Du Pont Dyestuffs.
Now, and in the years ahead, look to Du Pont for leadership in dyestuffs and technical service. The research facilities of our Laboratories are at your disposal in helping to solve your technical problems. E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Dyestuffs Division, Wilmington 98, Delaware.
Du Pont Dyestuffs
DU PONT DYESTUFFS
BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

, 1946

If you use couplings, this book will help you





Here you see the features that give Fast's Couplings their remarkable dependability. All parts are protected from wear by a positive film of oil. Oil purity is guarded by rocking bearings, located in the one position where they maintain a positive metal-to-metal seal. There are no perishable parts in "Fast's."

Here's a book prepared *by* engineers *for* engineers, with a minimum of words and a maximum of facts. Condenses between two covers complete technical data on Fast's Self-aligning Couplings: theory, design, principles of lubrication, types, complete dimensional information, how to figure size, how to order, and instructions for installation and operation. This book will help you solve your coupling problems . . . *for good.* Ask for a complimentary copy. Bartlett Hayward Division, Koppers Company, Inc., Baltimore 3, Maryland.

FAST'S *self-aligning* COUPLINGS

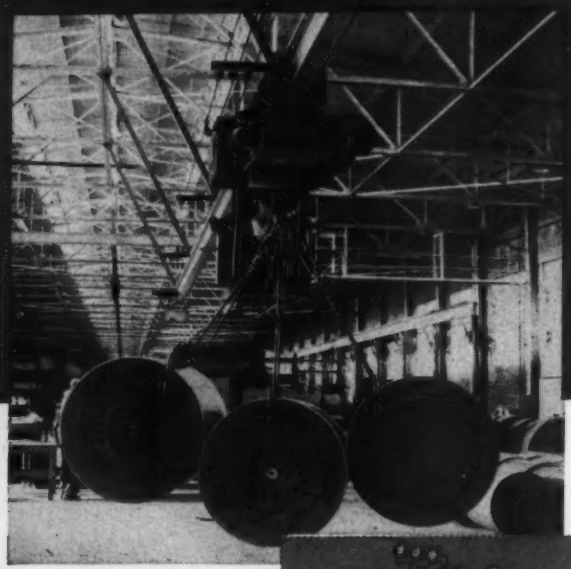
SAFEGUARD YOUR POWER TRANSMISSION

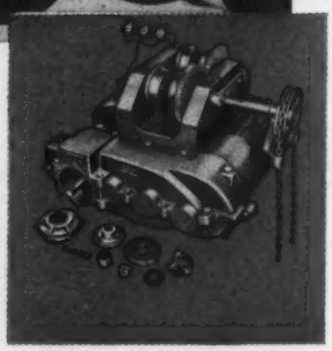
a **KOPPERS** *Product*

LIFTING HEIGHT *Increased* 2 FEET

WITH THIS

NORTHERN HI-LIFT ELECTRIC HOIST





SEE THIS POWERFUL MECHANICAL LOAD BRAKE

The powerful automatic disc and helix type mechanical load brake in the Northern Hi-Lift Hoist controls the lowering load, and can stop it independently of the electric brake. All wearing parts accessible—particularly brake surface.

ROLLER BEARINGS—HARDENED STEEL GEARS

Machine cut hardened steel gears, ample size roller bearings, turned and ground shafts, press fits—one piece welded frame.

Gears operate in oil bath, and distribute lubricant to bearings.

This Northern Hi-Lift Electric Hoist provides two feet more lift for handling paper in a large southern mill.

Northern Hi-Lift Hoists provide 12″ to 36″ extra lift, according to the capacity hoist—providing that much extra height in your present buildings—or saving that much in new buildings.

Northern Hi-Lift Hoists are number one favorites in hundreds of mills due to their dependability and exceptionally heavy construction.

TYPES OF NORTHERN HI-LIFT HOISTS AVAILABLE

Floor controlled hoists • Motor traveled hoists
Cab controlled hoists • Base mounted hoists

See our catalogs in Sweet's Files of Process, Mechanical and Engineering Industries.

New information on electric hoists, dimensions, engineering data, etc., is ready in this complete bulletin. Write today for Bulletin H-110.

NORTHERN ENGINEERING WORKS
3613 ATWATER ST.
DETROIT 7, MICH.

N·B·M's "Man from Mars"

GIVES YOU CLEANER BRONZE CASTINGS ...CUTS MACHINING COSTS

This weirdly-clad gentleman is an "efficiency expert" in disguise. His skillful sand-blasting gives every N-B-M casting a clean, sand-free surface that doesn't dull cutting tools.

Result: faster, more efficient machining—another time- and money-saving advantage of N-B-M Bronze Parts.

N·B·M BRONZE PARTS

N·B·M

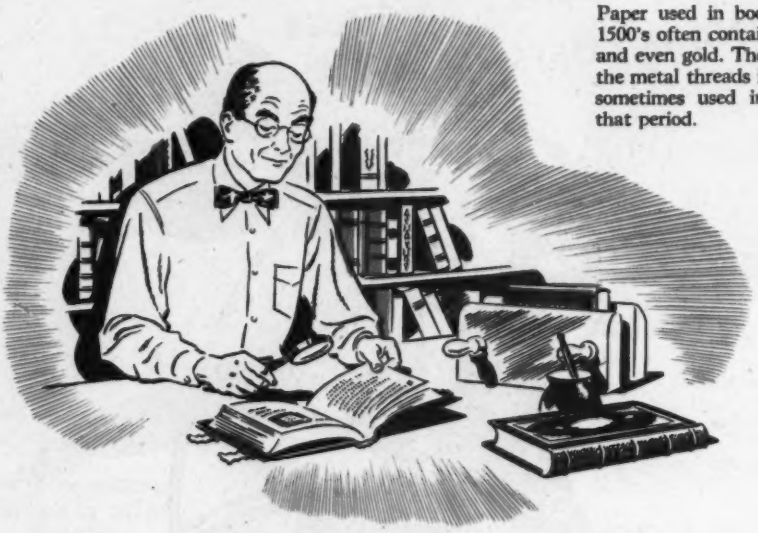
NATIONAL BEARING DIVISION

ST. LOUIS • NEW YORK

AMERICAN Brake Shoe COMPANY

PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

Interesting Facts About Paper



Paper used in books printed during the 1500's often contained particles of copper and even gold. These particles came from the metal threads in brocades which were sometimes used in papermaking during that period.

• Interesting Facts About Pheno Orange 5RE

PHENO ORANGE 5RE is an economical red shade of Direct Orange, particularly desirable where money value and good color value on the red shade side are of interest. It produces level dyeing and is used with excellent results on papers that need to be of good fastness to bleeding.

Complete information on PHENO ORANGE 5RE is available from your Heller & Merz representative on request.

Heller & Merz Department

CALCO CHEMICAL DIVISION • AMERICAN CYANAMID COMPANY

BOUND BROOK, NEW JERSEY

New York • Chicago • Philadelphia • Boston • Charlotte • Providence

Trouble-Proof

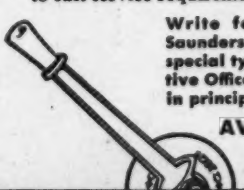
AGAINST CORROSION, CLOGGING AND PRODUCT CONTAMINATION

GRINNELL-SAUNDERS DIAPHRAGM VALVES

Screwed or Flanged Patterns

Users of compressed air, gases, viscous or corrosive liquids, food products and fluids containing suspended solids — this is the valve that may eliminate your troubles!

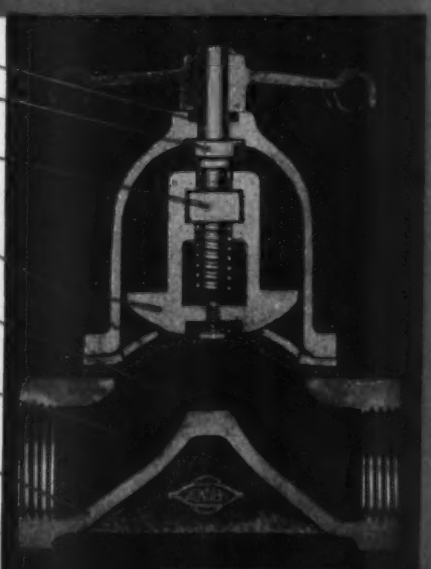
- ★ No packing glands to demand constant attention.
- ★ Non-rising stem eliminates breakage. Stem is protected from dust, weather and corrosion.
- ★ Working parts completely isolated from the fluid. No sticking, corroding or clogging to interfere with easy operation and tight closure. No contamination from valve lubricants.
- ★ Compressor and finger plate combine to support the diaphragm in all positions.
- ★ The large area of contact of the diaphragm on the seat, plus the resilience of the diaphragm, permits positive closure even when foreign matter is trapped.
- ★ No metal-to-metal seats to become damaged, wire drawn or scored. No refacing, reseating or grinding is required.
- ★ Streamlined passage without pockets reduces friction to a minimum and prevents accumulation of sludge and foreign solids.
- ★ The valve body — the only metal that could contact the fluid — can be completely lined with glass, porcelain, lead, rubber or synthetic compounds (flange type only) to suit service requirements.



Write for catalog describing Grinnell-Saunders Diaphragm Valves — standard and special types. Grinnell Company, Inc., Executive Offices, Providence 1, R. I. Branch offices in principal cities.

AVAILABLE IN SPECIAL TYPES

The "quick operating" lever design is one of several types.



VALVE OPEN

VALVE CLOSED

GRINNELL

FOUNDED 1850

WHENEVER **PIPING** IS INVOLVED

a modern tote-road (truck-road)

Photo courtesy Kimberly-Clark Corporation (See page 618)

1946

TRADE WINDS

Continued Shortage of Paper and Board Forecast

▶▶▶ A REPORT ISSUED BY THE U. S. Department of Commerce* on July 25 promises no immediate relief in the shortage of paper and paperboard.

Supplies in the second quarter 1946 were estimated at about 4,000,000 short tons at an annual rate, of consumption requirements. Third quarter requirements are expected to be about the same as those in the second quarter with production somewhat lower than in that quarter.

Between 185,000 and 190,000 tons of domestic newsprint capacity is scheduled to be diverted to the output of other classes of paper by the end of this year. The change-over is already under way and the tight newsprint supply situation is not expected to improve in the near future.

An analysis of the current situation in the pulp and paper industry, prepared by the Department's Forest Products Section, cites low imports of wood pulp from Sweden in May and June as the chief reason for the anticipated reduction in third-quarter paper and paperboard output.

This situation has resulted in heavy withdrawals from wood pulp inventories by producers who depend on imported pulp. Some paper mills are already faced with the necessity of curtailing production because of inadequate supplies of overseas pulp.

Imports of wood pulp from overseas during the next few months must average about 100,000 tons monthly if United States mills are to fill current needs and build up inventories to take care of the winter months when overseas shipments are normally small, the report states.

The trend toward integrating mill and converting operations is reducing the quantities of paper and paperboard available on the open market.

Publishers are purchasing paper mills to insure themselves a source of printing paper. Paperboard mills are buying box plants or otherwise expanding their plant facilities to include this type of operation. Building board and other paper-consuming manufacturers are purchasing paperboard mills.

Moreover, there is a growing tendency for paper mills to shift from the manufacture of unprofitable or low profit products to the more profitable grades. Thus, buyers of lower grade papers are having increasing difficulty in filling their needs.

Despite the failure of supplies of paper and paperboard to equal consumption requirements, total production in the first 5 months of this year was 8 per cent higher than in the comparable period of 1945, according to the report.

Increases in production of individual items for the 5-month period over the first 5 months of 1945 include: Newsprint, up about 3 per cent; book papers, 32 per cent; groundwood and printing specialty papers, 23 per cent; fine papers, 11 per cent; sanitary papers, 6 per cent, and tissue papers, 21 per cent.

Loss in domestic newsprint capacity resulting from diversion to other production will be compensated for eventually by 150,000 tons of new newsprint capacity which will be installed in the South by the end of 1947 or early 1948 and increased newsprint producing capacity in Canada and Newfoundland, according to the report.

Estimated consumption of newsprint in the United States in the January-May period of this year totaled 1,736,000 tons, an increase of 25 per cent compared with the like period of 1945.

This increased consumption was made possible by larger imports from Canada and Newfoundland, increased domestic production, and withdrawals from publishers' stocks, the report states.

Most Canadian mills have been working at close to practical capacity during the past few months. Maintenance of the present rate of output would increase Canadian production during the second half of the year by 60,000 tons above the total of the first 6 months.

Production of newsprint in Newfoundland is at about prewar levels and a large percentage of this output is being exported to the United States.

◆

PRICE CHANGES EXPECTED FROM EXTENSION OF OPA

The passage and signature by President Truman of the OPA extension bill and the return of Canada and Sweden to exchange parity with the American dollar have produced a situation which is variously described as an effort to unscramble an omelet, an effort to put Humpty Dumpty back on the wall, and a diagramless cross-word puzzle.

It is too early to forecast all the

(*) Copies of the complete report —July, 1946, *Industry Report on Pulp and Paper* may be obtained free on request from the Department of Commerce, Washington 25, D. C.

developments, but some are expected to be announced at an early date, especially those affecting price ceilings on various papers and paper products.

Canada during the month revalued the Canadian dollar to bring it into par with the American dollar, and Sweden took the same relative course with the Kroner. Canada's action was immediately followed by an increase in the price of newsprint, export prices being lifted $6.80 per ton to compensate for the loss of the previous exchange advantage of 10 per cent. The present American port price is $68 and manufacturers already had on file a request for a $4 per ton advance. The first problem of the OPA after the signing of the bill by the President was admitted to be an adjustment of ceilings on imported goods.

A few days after this action on newsprint, Canada took identical action on export pulp. A few days later Sweden adjusted its currency values in relation to the dollar, and an approximately equivalent price advance will be needed to give the Swedish manufacturers a return in dollars equivalent to that enjoyed prior to the revaluation of the kroner.

◆

GEORGE MEAD APPOINTED TO PRICE DECONTROL BOARD

Two days after President Truman signed the new OPA price control act, a three-man Decontrol Board was appointed. The board named was confirmed by the Senate without discussion. The three men chosen are:

Roy L. Thompson, Federal Land Bank of New Orleans, field organizer and official of the Farm Credit Administration, as chairman.

George H. Mead, chairman of the board of The Mead Corporation, and past president of the American Paper and Pulp Association. Mr. Mead has served in an industry-advisory capacity for the NRA, the WLB, and the OWMR.

Daniel W. Bell, former Under Secretary of the Treasury.

◆

OHIO PAPER CO. ADDS PAPER MACHINE—PLANS FURTHER IMPROVEMENTS

Installation of a second papermaking machine at the plant of The Ohio Paper Company, Miamisburg, Ohio, has been completed. It is expected this addition will triple the capacity of the plant. Robert P. Munger, president of the company, states that already 75 per cent of the product from the new machine is under contract for a period of five years.

George H. Mead (left), member of the new price Decontrol Board, is shown conferring with OPA Chief Paul Porter

The plant buildings have been remodeled to accommodate the new machine. A new boiler plant has been installed and further plans for expansion are now being studied. For the past year, the company has been experimenting with the use of wood fiber in its saturation process. The results have been successful to the extent that plans are being formulated for the installation of wood grinding equipment for converting sawdust shavings and other wood scraps that are usable as raw material.

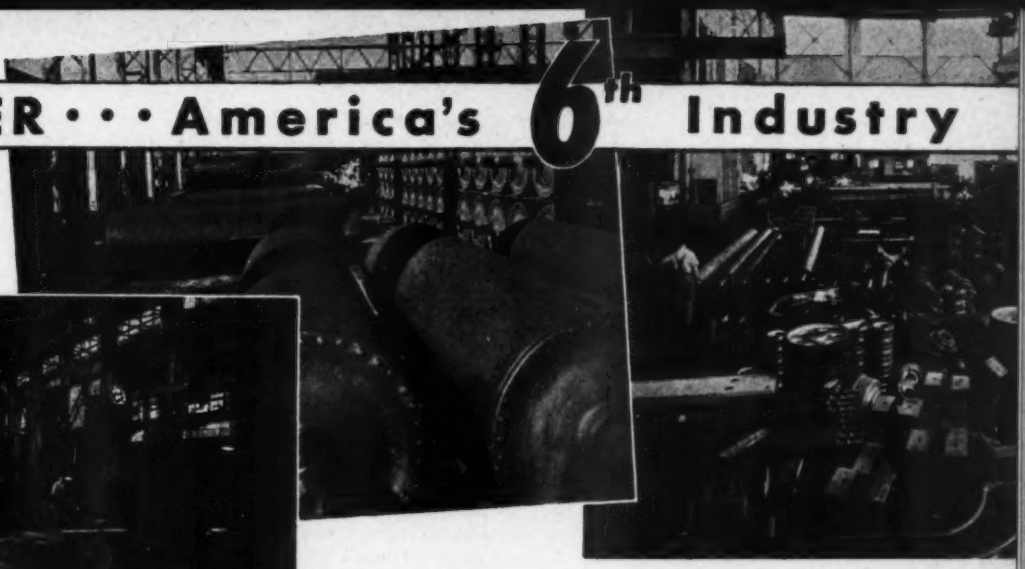
The Ohio Paper Company was established in the early 1870's for the manufacture of bond papers. Later it became a felt paper mill and operated as such until the 1920's when the mill was closed down and remained idle for about six years. In 1929, the property was leased by Robert P. Munger as a source for an additional supply of felt paper for a company with which he was associated in East St. Louis. The plant was then reconditioned and production resumed. From that time until the beginning of World War II, the mill produced almost entirely roofing and deadening felt. During the war, the plant was engaged in war production manufacturing all types of fillers used as packing for overseas shipment of munitions. Since the war, there has come a quick changeover to items that are in great demand in peacetime industry.

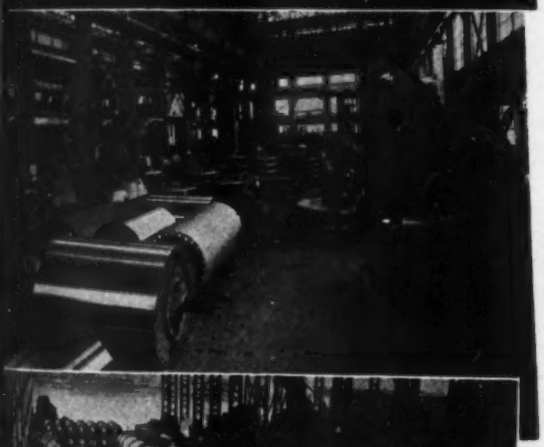
◆

CONSERVATION CAMP ESTABLISHED BY TREES FOR TOMORROW, INC.

Trees for Tomorrow Conservation Camp has been established by Trees for Tomorrow, Inc., on a non-profit basis. This project is an "on-the-spot-headquarters" where adult groups, youth organizations, educators, college students, foresters, and technicians of public and private agencies can meet and deal firsthand with facts pertinent to the full de-

PAPER · · · America's 6th Industry





PRODUCTION IN FULL SWING

Take a look at the production floor at Puseyjones. See how men and production facilities are working at full speed to give you the modern papermaking machinery you need.

Each new Puseyjones Machine incorporates the lessons learned in four years of war-time research and development—improvements that mean bigger tonnages for you.

Among the new machines under construction by Puseyjones are three of the largest and fastest Fourdrinier Machines, one for book and high grade printing, one for white paper for bags, and one for Kraft liner board; also one Cylinder machine of record size and speed for the manufacture of floor covering felt. Other machines are under construction for the manufacture of M. G. Kraft specialties, facial tissues and high grade bristols.

During the next eighteen months these machines will go into production in North Carolina, Massachusetts, Florida, Georgia, New Hampshire, New York, and California, as well as in Mexico.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF SUPERIOR QUALITY

velopment of the natural resources of this state. As a permanent center for observation and study this camp can help build a true appreciation of the economic, social and recreational values of our forest, lakes and streams, as well as project a widespread understanding of wise land use.

All contacts for camp periods should be made through M. N. Taylor, executive director, Trees for Tomorrow, Inc., Merrill, Wisconsin. Details of registration and payment of fees will be handled by a co-ordinator, to be appointed by each group. The camp is not operated as a resort, but as a conservation headquarters to give a maximum number of people from throughout the state an opportunity to take advantage of the facilities.

◆

NATIONAL GYPSUM ACQUIRES WESTERN BOARD & PAPER CO.

On July 1 the plant of the Western Board and Paper Company, Kalamazoo, Michigan, was taken over by National Gypsum Company. The plant will be operated under the name of National Gypsum Company and will be known as the company's Kalamazoo plant.

Leonard L. Hank, who has been manager of the plant for Western Board and Paper Company, will remain as plant manager for National Gypsum.

The operation of this plant is a step in a plan of more complete integration by National Gypsum. In January, this company took over the plant of Sonoco Products Company, Garwood, New Jersey, which, with the new Kalamazoo mill and its Newburgh, New York, plant, now gives it three paper manufacturing plants.

Since the first of the year, National Gypsum also has purchased three 10,000-ton ships to carry gypsum rock from Nova Scotia quarries to its seaboard plants. Two $3,000,000 plants are under construction; one at Baltimore, Maryland, and one at Kimballton, Virginia.

◆

MANDO AWARDS FORESTRY RESEARCH SCHOLARSHIP

The graduate scholarship in forestry research in the Forestry College of the University of Minnesota offered by the Minnesota and Ontario Paper Company (Minneapolis) has been awarded to Harvey E. Djerf of Minneapolis. The scholarship valued at $900 was made available for the first time this year to graduate students in the forestry school.

Mr. Djerf received his bachelor of science degree from the Forestry College in 1943. He served for thirty-four months in the Army, eighteen of which were in the European theater. The first of this year he returned to his studies.

The purpose of the research project for which the scholarship is awarded is the study of the various methods of slash disposal to determine the effectiveness of each in the reduction of fire hazard, and the effct of the different methods on the establishment and growth of natural forest reproduction.

◆

"TRUCK-TRACK"

One of the most unusual photographs picturing a mode of transportation through heavily wooded spruce-swamp areas is shown on page 614. This illustration appeared on the cover of Kimberly-Clark Corporation's Annual Report 1945. Quoting from the description of Cover Scene in the Report:

"Tote-road is a means toward year-'round woods employment and served well during the war period when high production was essential and these working areas would otherwise have been inaccessible excepting during the winter season. In its over-all aspects, the cover's woodland scene reflects one of the basic contributions which Canada made to Victory."

◆

WISCONSIN CLAIMS 1/6 OF TREES PLANTED ON AMER. FARMS DURING 1945

Wisconsin accounted for one-sixth of all tree plantings on American farms during 1945, according to Fred Trenk, University of Wisconsin forester. He said that of the more than 37,000,000 trees planted by farmers in 42 states and in Puerto Rico and Hawaii, 6,226,900 were in Wisconsin. The next three states were Pennsylvania, Georgia and New York, with less than three million each.

The trees were supplied by the nurseries of the Wisconsin Conservation Department, co-operating with the U. S. Departmnt of Agriculture. These nurseries produced more than 13,000,000 trees last year and will supply about 14,500,000 this year. Nurseries in other parts of the country produced less than 50,000,000 trees last year. Of the Wisconsin plantings, about 1,500,000 trees were planted with tree planting machines.

"Planting prospects for the next few years will include fewer of the popular Norway pine," Trenk said, "because nurseries in Wisconsin are nearing the end of their supply of Norway pine seed, following an eight year period of poor seed crops. But this year's bloom indicates that a good seed crop is in prospect for the fall of 1947. This will not make itself felt until about 1950, because after the seed crop is collected a year from this fall, there will still be a two-year lapse before seedlings from it are ready to plant."

◆

FINANCIAL

▶▶▶ The sharpest decline in securities prices since early in the year took place the latter part of July. Industrial issues were particularly affected, and at least part of the reason for the decline was the belief that Washington developments, such as the renewal of OPA controls would serve to adversely affect manufacturing enterprises.

Stock Flotations

Hudson Pulp & Paper Corporation—An issue of $3,000,000 in sinking fund debentures will be offered to finance construction of a mill near Palatka, Florida.

Nekoosa-Edwards Paper Company—Holders of common stock will be offered 63,000 shares of $25 par value common stock on the basis of one share for each four held as of August 1, 1946. The price of the issue is not yet announced.

Corporation Earnings

Brown Company—Net earnings for twenty-eight weeks ended June 15, 1946, were $879,868, as against $821,263 for the comparable period a year ago.

Certain-teed Products Corporation—Net income for six months ended June 30, 1946, was $1,712,321 as against $421,634 a year ago.

Container Corporation of America—Net income for six months ended June 30, 1946, was $2,692,551, as against $1,002,134 in the previous year.

Crown Zellerbach Corporation—Net profit for the fiscal year ended April 30, 1946, was $7,824,983, as against $7,093,085 for the previous year.

Robert Gair Company—Net income for six months ended June 30, 1946, was $1,106,037, as against $393,116 in the same period of 1945.

Hummel-Ross Fibre Corporation—Net profit for twenty-four weeks ended June 15, 1946, was $343,725, as against $201,168 for the same period in 1945.

Masonite Corporation—Net income for three months ended May 31, 1946, was $682,626, as against $321,284 a year ago. Net income for nine months ended the same date, was $1,831,006, as against $933,764 for the same period in the previous fiscal year.

The Mead Corporation—Net profit

ARE YOU SHORT OF POWER

IN YOUR MILL? IF SO

SUTHERLAND

Continuous

BEATING AND

REFINING

CAN HELP, BY SAVING

SOME OF THE POWER YOU NOW HAVE

SUTHERLAND REFINER CORPORATION

TRENTON, NEW JERSEY · *Manufactured in the United States by Valley Iron Works Co., Appleton, Wis.*

SUTHERLAND REFINER LIMITED, 319 DRUMMOND BLDG., MONTREAL P.Q., Manufactured in Canada By The John Bertram & Sons Co. Ltd., Dundas, Ontario

for twenty-four weeks ended June 15, 1946, was $1,276,117, as against $511,262 for the comparable period in 1945. Net profit for twelve weeks ended June 15, 1946, was $701,627, as against $264,142 in 1945.

Minnesota and Ontario Paper Company—Net income for the first six months of 1946 was $1,004,414, as compared with $529,296 for the same period in 1945.

Rayonier, Inc.—Net profit for the fiscal year ended April 30, 1946, was $2,075,379, as against $3,624,319 for the previous year. The decrease was attributed principally to higher wood costs, increased wages and the unusual expenses caused by the reopening of the Shelton mill closed by war conditions.

Sutherland Paper Company—Net income for six months ended June 31, 1946, was $734,071 as compared with $277,141 the previous year.

New York Stock Exchange—Stocks

	Closing Prices July 25	June 25
A.P.W. Products ..	7¾	8¼
Celotex	30½	34¼
Same Preferred..	*21⅜–22	22⅜
Certain-teed Prod..	22	23¾
Champion P&F Co.	51¾	*58–60
Same Preferred..	110½	111
Container Corp....	46½	50¼
Cont. Diamond ...	12⅜	14½
Crown Zellerbach..	33	33¾
Same Preferred..	109⅛	108¼
Same $4 Pref....	*123–124	*125–132
Dixie Vortex	41	47
Same "A"	*55–57	57½–58¾
Gaylord Container.	18½	20½
Same Preferred..	*108–116	*117–125
International Paper	46	45⅜
Same $5	116⅛	115½
Same New $4..	103	....
Kimberly-Clark ...	*61–62½	*63½–64
McAndrews & Forbes	39½	*41⅜–42
Masonite	63	66
Mead Corp.	25½	24
Same Preferred..	....	105¾
National Container	30	33
Paraffine Cos.	78½	*82-84
Same Preferred..	*119–115	*108–115
Rayonier, Inc.	25½	27¾
Same Preferred..	37¾	38
Scott Paper	57	*56–57
Same Preferred..	*107–109	110½
Sutherland Paper..	44¾	43
U. S. Gypsum.....	113⅛	*122¼–124⅝
Same Preferred..	....	200¼
West Va. P&P....	43	47½
Same Preferred.	*112–112½	*113–114

New York Stock Exchange—Bonds

Abitibi 4%	112	...
Celotex 3¼%	105½	...
Certain-teed Prod. 5½%	...	...
Champion P&E Co.	...	...
International Paper 5%	...	101¼

New York Curb Exchange—Stocks

Am. Writing	9⅜	...
Great Northern ...	40	40⅜
Hummel Ross	...	16⅝
St. Regis	12⅜	13¾
Taggart	...	11
United Wall Paper.	...	11⅛

*Closing Bid and Asked Prices.

Group of Wisconsin Mills Plan Reclamation Yeast Plant

▶▶▶ PLANS FOR THE utilization of waste sulphite liquor from paper mills in the manufacture of yeast are being formulated by leaders of the paper industry in the State of Wisconsin.

The first plans call for one such plant which could handle 50 tons of waste material a day, but if successful, the program will not only bring in revenue from by-products, but it will result in the construction of other similar plants in the state—perhaps plants near paper mills in the state.

The possibilities of such a plan are unlimited—not only with respect to the millions of dollars in revenue that will accrue, but it is altogether likely that stream pollution may be eliminated, a problem which for many years the paper industry has been challenged to solve.

Behind this great movement are eleven paper companies comprising the membership of the Sulphite Pulp Manufacturers' Committee on Waste Disposal. For a number of years the Committee has been engaged in research activities on stream pollution centered at the Institute of Paper Chemistry in Appleton. In addition to Institute research, the Committee also has sent a chemist to Germany to study plants there, according to J. M. Holderby, (Appleton), research coordinator for the Committee.

Plants represented in the research group are estimated to have a total pulp capacity of nearly 1,350 tons each 24 hours, meaning that an amount of waste equal to that figure is at present discarded, since by the sulphite process only half the wood is used in pulp. It has been estimated that in the entire industry sulphite producers discard some 2,000,000 tons of noncellulosic material each year.

J. M. Conway, president of the Hoberg Paper Mills, Green Bay, is chairman of the Committee. Other member firms and their committee representatives include:

Marathon Corporation, Rothschild, Allen Abrams, vice president; Kimberly - Clark Corporation, Neenah, Ernst Mahler, vice president, and Cola G. Parker, president, (also financial trustee for the Committee); Consolidated Water Power & Paper Company, Appleton, Stanton Mead vice president, and L. E. Smith, manager of the Appleton division; Nekoosa-Edwards Paper Company, C. H. Reese, general superintendent; Falls Paper & Power Company, Oconto Falls, Clayton Ewing, president; Rhinelander Paper Company, Folke Becker, president; Northern Paper Mills, Green Bay, A. B. Hansen, president; Flambeau Paper Company, Park Falls, Leonard Kuehl, manager; Badger Paper Mills, Peshtigo, Edward Meyer, president; Marinette Paper Company, C. A. Wilkinson, manager, and the Detroit Sulphite Company, Michigan, G. N. Carleton, president.

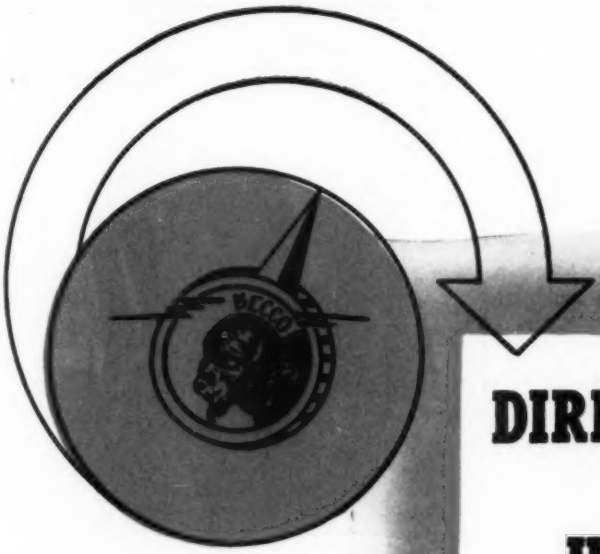
A process already has been developed which is better than the German method which allows the yeast to be used for animal feed. The feed yeast project will be of particular importance in Wisconsin, because large quantities of low priced feed can be used by the dairy industry. However, leaders in the paper industry envision the possibilities of such production throughout the United States wherever sulphite mills are located.

◆

BRITISH PAPER NOTES (June, 1946)

The Savoy Hotel, London, recently witnessed a gathering which will be remembered in the annals of the British Paper Trade for the British Pulp Association celebrated its Golden Jubilee. Printed souvenirs were presented to everyone attending, and the president, Sir Keith Price, read many messages of congratulations from friends in the wood pulp trade of Sweden, Norway, and Finland, together with one from the president of the Canadian Pulp and Paper Association, R. M. Fowler. The British Paper Controller, Sir Ralph Reed, who was to have addressed the gathering, was unavoidably absent through illness, and his speech was read by his cousin, Sir Arthur Reed. Sir Ralph recalled the early connection of his family with the wood pulp industry in Canada, Newfoundland, and Scandinavia, and speaking of present days, he emphasized how magnificently the North American countries had come to the rescue of the British Paper Trade following the dark times of 1940. An interesting event of the evening was the presentation of a chain of office to the British Wood Pulp Association by Consul Thorsten Lundgren on behalf of the Swedish Cellulose and Wood Pulp Association.

Incidentally, the importation of wood pulp and other papermaking materials into the United Kingdom continues on a very low scale. This is confirmed by the figures recently published covering the first five



DIRECT FEEDING OF HYDROGEN PEROXIDE

In Accordance with BECCO Methods... Has Many Advantages:

It guarantees uniform addition of chemicals at all times and, therefore, best results.

It eliminates the use of mixing tanks and weighing and handling of chemicals; it requires very little floor space for handling and preparing.

It eliminates spillage and wastage of chemicals.

It simplifies control of the bleaching process.

There are many advantages to be gained by bleaching groundwood pulp with BECCO HYDROGEN PEROXIDE bleaching methods. Why not investigate them?

BECCO's engineers and chemists are experts in the bleaching of groundwood pulp. For details write to:

BECCO SALES CORPORATION

AGENTS FOR BUFFALO ELECTRO-CHEMICAL CO., INC.

20 Sawyer Avenue, Buffalo 7, N. Y.

New York Boston Philadelphia Chicago Charlotte

months of 1946. The total for the period January-May 1938 was 817,815 tons, while during the same period in 1946 only 311,382 tons have been imported, or a little over 38 per cent. During May of this year, 99,366 tons were imported, and this figure is only slightly more than 100 per cent above the total for May 1945, when the war in Europe had only just ended. It is noticed that imports in May 1945 were received entirely from Canada and the United States (33,229 and 8,018 tons, respectively). Canada, during May 1946, dropped to 5,704 tons, and the United States to 1,429 tons, their places being taken by the Scandinavian countries, of which Finland was responsible for 29,642 tons and Norway 1,817 tons, pointing to the reappearance of these countries in the British market. Over 26,000 tons of esparto grass have been received so far this year, which is proving a slight help to the esparto mills.

The paper position generally, however, is as restricted as ever despite the fact that George Isaacs, Minister of Labor, recently stated that there was a possibility of increased paper supplies,particularly newsprint, by the end of July. This optimistic pronouncement has been contradicted by another member of the House speaking on behalf of the President of the Board of Trade.

Whether increased supplies of paper will appear soon remains to be seen, but it is extremely doubtful. Meanwhile, nearly everybody is endeavoring this year to have a short vacation by the sea, in many instances the first for seven years, and it is at the popular seaside resorts that the paper shortage is most apparent. Newspaper circulation in this country is on a different scale than in the United States. There are only nine morning newspapers, including the Labor *Daily Herald* and the Communist *Daily Worker*, and since the country is so small these papers circulate all over the country, consequently circulations in some cases run into millions. The *Daily Express*, for example, claims a circulation in the region of three and a half million. It is most amusing to see the daily trek in the early morning by hundreds of male holiday makers from one newsstand to another in a vain hope of obtaining their particular daily paper or any other that happen to be on sale. But unless one happens to be there as the newspaper trains arrive, his hopes of obtaining a paper are remote. The distribution of hand bills and other throw-away literature, the usual feature of popular resorts, is completely absent and even view cards are hard to find. There is, however, one hopeful sign—a marked increase in stationery supplies. The cheaper forms of packet envelopes and small writing pads at such stores as Woolworths are appearing in fair quantities and there is a marked decline in prices over a few months ago.

But that there is no immediate prospect of a decline in wholesale prices is confirmed by the recent announcement of an advance in price of coated art papers by £4-13-4 per ton and of chromos by £7 per ton. Doubtless the recent Government announcement of advances in the prices of coal and rail transport will produce a demand on the Paper Control for increased paper prices generally. Coated papers which are classed as converted papers are not subject to price control, ruling prices being the outcome of agreement on this point by the members of the Coated Paper Section of the Trade.

At a dinner of the Strathmore Paper Company's 25-year Club, President George E. Williamson (left) presents a 25-year pin to Harold A. Bolles (center), youngest active member of the Club, while Alvan W. Thompson (right), oldest active member, looks on

◆

SERVICE PINS AWARDED TO 72 STRATHMORE EMPLOYEES

The first postwar meeting of the Twenty-five Year Club of Strathmore Paper Company, Woronoco, Massachusetts, was marked by the induction of 72 employees as members eligible for service pins.

The large number of awards was occasioned by the postponement of such ceremonies for four years during the war.

Presentation of the service pins was made by President George E. Williamson, and during his remarks he announced that out of the 170 members enrolled in the club since its inauguration, 163 are still actively employed. The service represented by club members totals 5,224 years.

Horace A. Moses, chairman of the board and founder of the company, was unable to attend the presentation of awards, but he sent a message which was read during the evening.

◆

SHAMROCK INDUSTRIES BUILDS FIRST UNIT OF PAPER PRODUCTS PLANT

Incorporated under California law with a capitalization of $500,000, the Shamrock Industries is constructing the first unit of a paper products plant near San José, California.

The plant which will cover an area of 40,000 square feet will be used in the manufacture of paper napkins, waxed paper lunch rolls, toilet tissue, and paper towels. Installation of machinery equipment is expected to begin this month.

The company has announced plans to build two additional plants. One is to be located near Los Angeles, and one in the Pacific Northwest.

◆

FOREST FIRES CONTRIBUTE TO THE HOUSING SHORTAGE

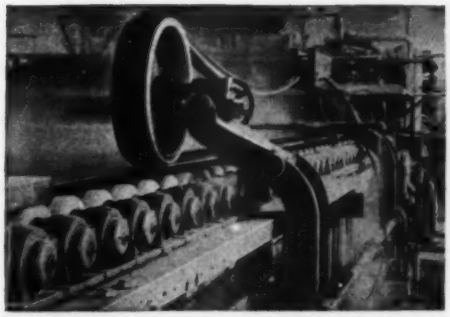
Homes burn when forests burn! Forest fires are an acknowledged menace to the public well-being. The lumber shortage is critical at the present time, and forest fires destroy timber—lessening the supply of material for

On wet, hot or dusty jobs... get better lubrication with

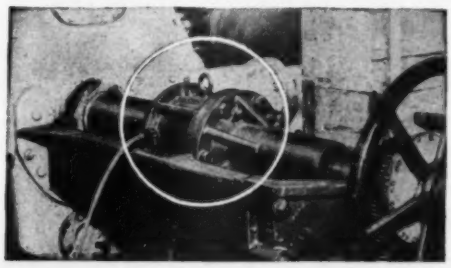
SUPERLA GREASES

Superla Greases are available in two types and a wide range of grades. You will therefore find them the answer to better lubrication of anti-friction bearings under many operating conditions.

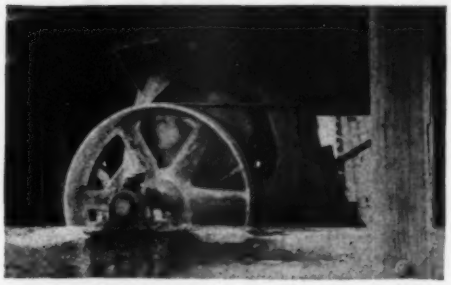
Just a few examples are briefly described here. The booklet gives more details of the properties and qualities of Superla Greases. It may help you save maintenance and money by showing you how to reduce bearing failures. Write Standard Oil Company (Indiana), 910 S. Michigan Avenue, Chicago (80), Illinois, for a free copy of the booklet.



WET Wet-end roll bearings on paper mills are particularly difficult to lubricate because they are subjected to a constant shower of water. They require a high grade moisture-resistant lubricant such as Superla Numbered Greases, which are lubricating many installations of this type.



HOT In Jordan bearings, pressures are high and excessive temperatures frequently occur. The high grade Stern Stafford anti-friction bearings pictured above have been successfully lubricated for a number of years with high temperature Superla X Grease.



DUSTY Because all bearings can't be operated in air-conditioned surroundings, some, like the crusher bearings pictured above, need the all-weather protection of Superla Grease. Before Superla was used, these bearings twice needed replacing because of summer overheating, which allowed the grease to leak out and dust to get in. With Superla Grease, no bearings have failed, summer or winter.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

★ LUBRICATION ENGINEERING

new homes. In recent years, more than 30,000,000 acres of forests have been destroyed by fires 90 per cent of which were due to carelessness of people traveling in forest areas.

In order to impress upon the public the importance of losses in natural resources, increased housing shortages, and even increased rentals several agencies have undertaken a program of education to bring the problem of forest fire damage more forcibly to the attention of the public. The United States Forest Service, the American Forest Products, Incorporated, the American Forestry Association, the Association of State Foresters, and the Red Cross have joined in this co-operative effort to prevent forest fires through public education. The New York State College of Forestry at Syracuse subscribes to the campaign through its Extension Department.

◆

THREE FRENCH PAPER MILL EXECUTIVES VISIT U. S.

While on a tour of pulp and paper mills of the United States, three executives of a kraft mill in France were interviewed recently at the offices of THE PAPER INDUSTRY AND PAPER WORLD, in Chicago.

The gentlemen were: Jacques Crouneau, technical manager; André Berges, chief engineer; and Guy A. Frank, technical engineer, who are connected with the firm Papeteries de Gascogne, of Mimizan, Landes, France.

The Landes district is the area of maritime pine planting, and location of the French kraft industry. The de Gascogne plant produces daily 100 tons of kraft pulp and 50 tons of paper. According to Dr. Otto Kress ("Some Observations on the French and German Paper Industry," P. I. and P. W., Nov. 1945), the French kraft industry consists of four kraft mills that, from the actual building standpoint, were very well constructed and of a size which gave the impression of having capacities several times their present production. From his observations, Dr. Kress further states that the French paper industry suffered during the war mainly from lack of coal, transportation, and imported pulp and wood. The visiting gentlemen stated that during the invasion and occupation of France by the Nazi armies, their mill suffered no actual damage.

The gentlemen from France visited the United States to study the processing techniques and the design of modern pulp and paper mill machinery. They arrived in the States on May 19. While here, they visited a number of large pulp and paper mills in the South, the Midwest and Canada, as well as many of the equipment manufacturers.

The family of Monsieur Berges, chief engineer, has been associated with the paper industry in France since 1565.

◆

KEUKA PAPER MILL BURNED

Fire destroyed the Keuka Paper Mill, Penn Yan, New York, on July 13, with an estimated loss of $100,000.

This mill began to make paper from straw in 1865. It was known as the W. H. Fox & Son Mill until 1944 when it was sold to its present owners by John C. Fox.

FIVE PRECIPITATORS BEING INSTALLED AT UNION BAG & PAPER CORP., SAVANNAH

Construction nas started at the Savannah, (Georgia), plant of Union Bag & Paper Corporation on electrical precipitator equipment, designed to eliminate smoke and many of the odors resulting from gases released in the kraft pulp manufacturing process, it is announced by T. T. Dunn, resident manager.

The cost of the equipment, and rearrangement of breeching to the present stacks, will cost approximately $500,000.

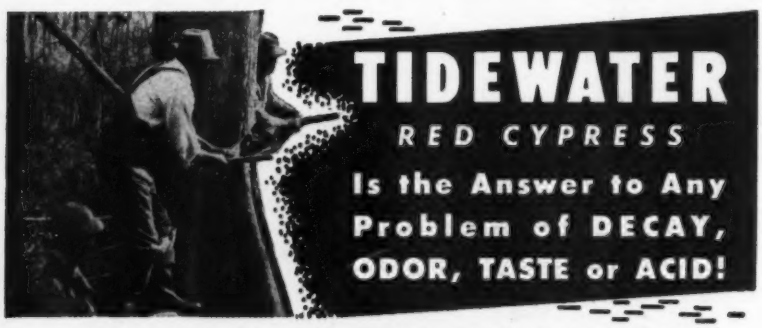
The foundation for the units has been laid, and the giant chimney is already up to a height of approximately 150 feet. The five precipitators will represent the largest single group installation of its kind in the pulp and paper industry.

Gases from the nine recovery furnaces in the pulp and paper mill will pass through the precipitators and into the huge stack which is designed further to reduce odors by discharging the gases into the atmosphere at a high level.

The electrical units, on order for nearly two years, are being completed by the Research Corporation of Bound Brook, New Jersey, and will be installed within the next few months. The precipitators, Mr. Dunn said, erected by the Morton C. Tuttle Company, are expected to be in operation about the first of next year.

Mr. Dunn said the electrical precipitation method, originally used to combat smoke from power plant stacks, has only in the past few years been developed for other industries, including kraft pulp mills. The Union Bag equipment will eliminate practically all of the smoke, and minimize the amount of odor from the recovery furnace flue gases.

The mammoth chimney, an integral part of the electrical precipitator



...Its Superior Qualities Make It Ideal for a Wide Range of Industrial Uses

The Indians knew it, the Spaniards knew it, the French knew it, and those of English decent of the Southeastern regions have known for 150 years the superior qualities of Tidewater Red Cypress and its resistance to decay. Along the Atlantic Coastal Plain where lie buried cypress trees that grew over 100,000 years ago in the Pleistocene Age, many of which have since been dug up, give mute evidence of the lasting qualities of cypress never equalled for its decay resistance. In more recent years industry has also learned that it licks the difficulties of odor, taste and acid. Tidewater Red Cypress has ALL the qualities you demand for many specific industrial demands.

Tidewater RED CYPRESS

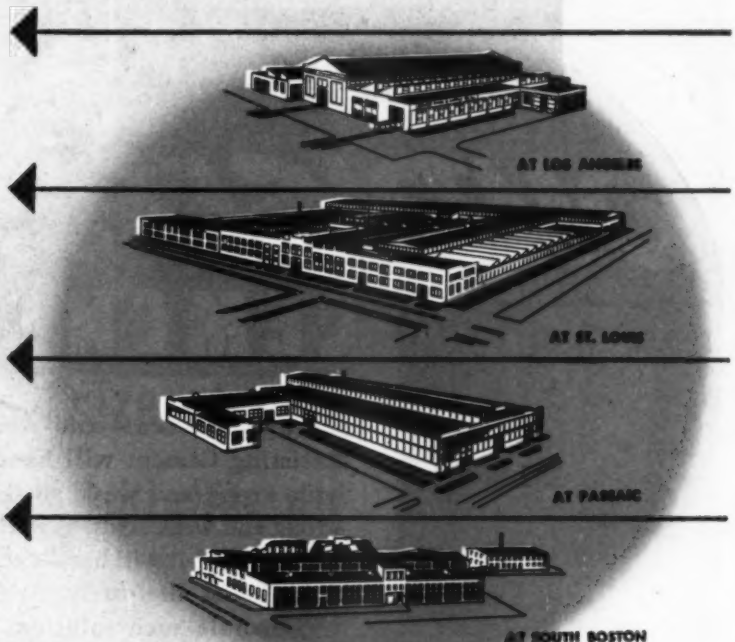
The Wood Eternal

CAN BE FURNISHED FROM ST. LOUIS STOCKS

FLEISHEL LUMBER CO.
4234 DUNCAN AVE. • ST. LOUIS 10, MO. • NEwstead 2100

TO THE USER OF FABRICATED PIPING

4 PLANTS Are Better THAN 1



There are four Midwest pipe fabricating plants located in different parts of the country, because Midwest has found that "four plants are better than one" for the user of piping.

In addition to shortening shipping distances and making for a better understanding of the customers' individual problems, four plants provide other important benefits in which all Midwest Piping users participate.

Extra reserve capacity is provided for the emergency job. If extreme speed is sufficiently important, a job can be divided among two or more plants. An overload in one plant often can be handled by temporarily transferring skilled workers from other plants.

One of the greatest advantages is the continuous exchange of information and experience between staff members of the four plants. New techniques developed in one plant are made known to all. Piping problems which may be new to one plant probably are very familiar to another where the "know how" information is available at once. Friendly rivalry—constant study of piping problems by four organizations—tends to advance the art of piping fabrication much more rapidly than would otherwise occur.

All of this works to the advantage of piping users —four plants are better than one.

Midwest can give you better piping and better service . . . whether you need only a simple bend or the most elaborate piping job completely erected and ready for operation.

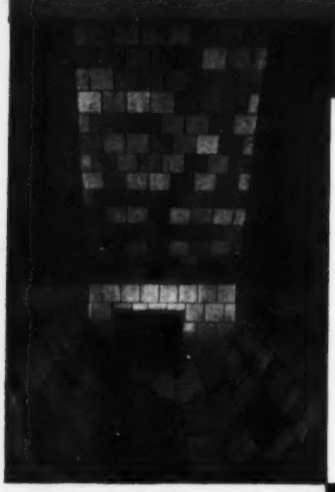
1527

MIDWEST PIPING AND SUPPLY COMPANY, Inc.

Main Office: 1450 South Second Street, St. Louis 4, Mo.
Plants: St. Louis, Passaic (N. J.) and Los Angeles
Subsidiary: Lumsden & Van Stone Co., South Boston 27, Mass.
Sales Offices: New York 7—30 Church St. Chicago 3—645 Marquette Bldg.
Los Angeles 33—520 Anderson St. Houston 2—229 Shell Bldg.
Tulsa 3—533 Mayo Bldg. Atlanta 3—Red Rock Bldg. South Boston 27—426 First St.

PIPING FABRICATORS AND CONTRACTORS

For Resistance to Both
ALKALIES AND ACIDS
use
DURISITE
CEMENT



Durisite Alkali-and-Acid-Resisting Cement will handle both strong and weak alkalies, strong and weak acids, as well as all solvents.* It will handle acids and alkalies alternately. And it will handle such solutions at temperatures up to 350° F.-375° F.

**Except for highly oxidizing solutions.*

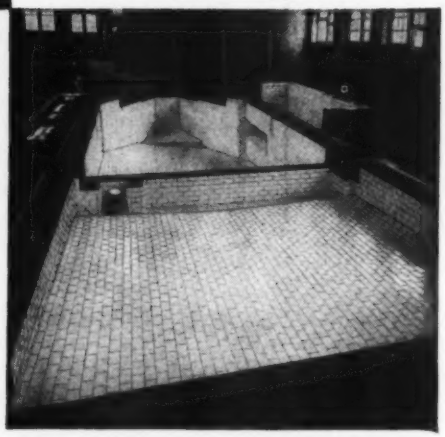
THESE EXTRA
Advantages
MAKE DURISITE YOUR BEST BET

1 Durisite is non-toxic . . . Has no dangerous effect on the skin.

2 Durisite can be stored indefinitely . . . No deterioration, no spoilage loss.

3 Durisite is dense, non-porous . . . Absorption less than ½ of 1%.

4 Durisite sets quickly by chemical action . . . Takes an initial set in 20-30 minutes.



Write for this
FREE BOOK
56-page manual on Corrosion-Resistant Masonry Construction . . . yours on request. Ask for Bulletin 813.

U. S. STONEWARE
Since 1865 — Akron 9, Ohio

installation, will be 250 feet high, and will be completed within the next four weeks.

This chimney, 25 feet in base diameter and 20 feet at its top, inside measurements, is being erected on an octagon-shaped concrete base, 5 feet thick. This is supported by 91 piles sunk 40 feet deep, each capable of bearing 40 tons dead weight.

More than 1,400,000 brick and tile will go into the chimney with the top 55 feet constructed of special acid-resisting brick and mortar. Large steel bands will be installed at approximately 25-foot intervals to allow for expansion and wind load.

◆

MEAD INTERESTS REPORTED TO HAVE PLANS FOR PULP MILL AT BLIND RIVER (ONT.)

With Canada moving into a position as pulp center of the world, government officials estimate an amount approximating $100,000,000 is being spent for new pulp mills and plant expansions in the Dominion.

Added to the list of important projects completed and nearing completion is the late announcement of a pulp mill to be constructed at Blind River (just east of Sault Ste. Marie).

News reports state this mill will be constructed as a joint operation with the J. J. MacFadden Lumber Company acting as operating company for Huron Forest Products Company, controlled by the Mead Corporation.

◆

EXPANSION UNDER WAY AT NATIONAL PAPER CORP.

Expansion at the plant of National Paper Corporation, Ransom, Pennsylvania, includes: a machine room and pulp storage building, boiler house, filtration plant, and converter building. New offices are under construction in a portion of the original building.

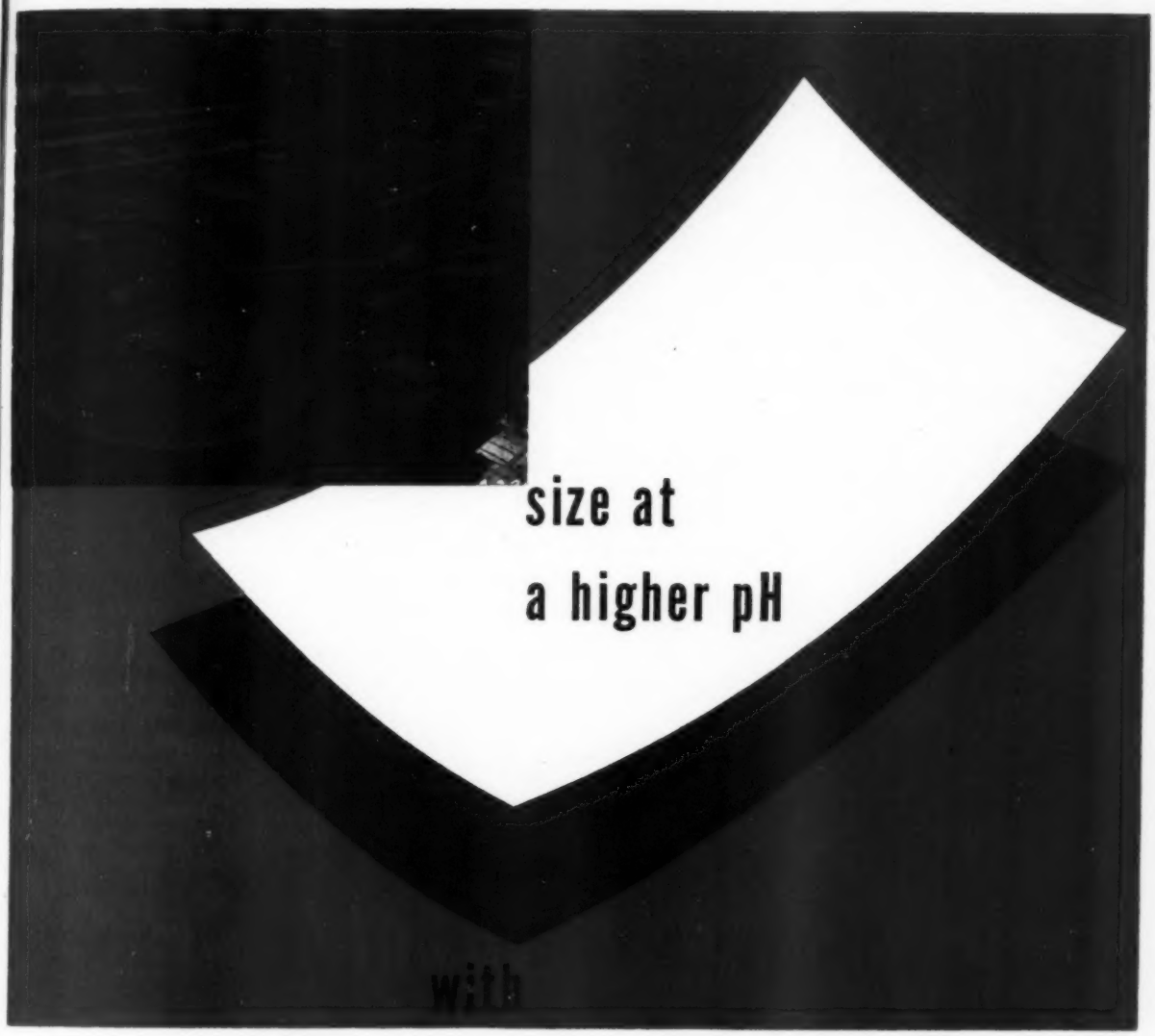
The most modern machinery will be installed for making facial tissue, toilet tissue, paper napkins, and toweling.

◆

DEPT. OF COMM. SETS UP OFFICE OF TECH. SERVICES

The establishment of an Office of Technical Services was announced on July 9 by the Department of Commerce. The new office consolidates the work of the Office of the Publication Board, Technical Industrial Intelligence Branch, National Inventors Council, and Production Research and Development Division.

The Office will continue the work of the consolidated units and launch a new program of technical aid to



Monsanto's SODIUM ALUMINATE

Mill men using Monsanto's Sodium Aluminate have discovered advantages with this alkaline source of alumina never before possible through any combination of materials or methods:

Stability—6% solutions are stable almost indefinitely . . . may be introduced at any point in process prior to formation of web . . . eliminates costly shutdowns and repairs due to clogging of lines.

Eliminates Pitch Troubles at press rolls, due to insufficient alumina in furnish.

Reduces corrosion and increases wire life.

Reduces acidity of white water — more suitable for re-use.

Improved paper product — less yellowing, less brittleness with age; better color retention.

MONSANTO CHEMICALS

If you are not yet acquainted with the advantages of Monsanto's Sodium Aluminate, ask for full information today . . . samples, technical bulletins, or arrangements for a mill trial. Address: MONSANTO CHEMICAL COMPANY, Merrimac Division, Boston 49, Mass.

business and industry. The 1946-47 appropriation, just approved by Congress, includes increased administrative funds for the new Office, as well as $1,500,000 for research and development.

The OTS will consist of four major units: the Invention and Engineering Division, the Industrial Research and Development Division, the Library and Reports Division, and the Technical Industrial Intelligence Division. The last-named is responsible for investigation of German industry and the collection of German scientific and technical information.

◆

CORRECTION

In an item which appeared on page 478 of the July issue of this magazine, an erroneous statement is regretfully acknowledged. The item, headed "Old Mill at Piercefield May Be Equipped to Make Wood Prods. & Plastics," stated that "rights to the waterpower of the mill are retained by Systems Properties, Inc., a subsidiary of International Paper Company."

The latter part of the foregoing sentence was a misstatement since System Properties, Inc., is not a subsidiary of nor affiliated with International Paper Company.

CANADA NEWSPRINT OUTPUT INCREASED 29.7 PER CENT

Newsprint production in Canada in the first six months of this year totaled 2,002 tons, an increase of 29.7 per cent from the 1,544,516 tons for the comparable period of 1945.

Shipments were 1,960,134 tons, an increase of 30.4 per cent from the 1,503,362 tons shipped in the first six months of last year.

The Newsprint Association of Canada has released figures showing that Canadian mills shipped 115,676 tons inside Canada in the January-June period of this year; 1,588,867 tons to the United States and 255,591 overseas. In June, 19,042 tons were shipped inside the dominion; 269,271 to the United States and 34,492 overseas.

◆

"PAPER FOR EVERY USE" TRADE-MARK FOR NEWLY FORMED PAPER CENTER

Operating under the trade-mark, "Paper for Every Use," the newly established Paper Center, Incorporated, New York City, will offer jobbing and distributing services, as well as information and assistance in the merchandising of quality printing, lithographing, packaging, and specialty papers.

The new firm is headed by Bernard H. Ross, former sales promotion manager of the Milton Paper Company, Inc.

Trained consultants will be available to buyers, sales managers, and clients' advertising agencies for service in merchandising research, package design, and product development.

Adequate warehouse facilities are available and display space is provided for permanent exhibits of paper and paper products at the Center's main office.

◆

PLANTS OF N.Y.-PENNA. AND CASTANEA ARE MERGED

Merger of the New York and Pennsylvania Company and the Castanea Paper Company, Lock Haven, Pennsylvania, has been announced.

The consolidation was effective July 1. The operation of the mills will not be affected by this change. The mills in Lock Haven and Castanea Township will be known as New York and Pennsylvania Company, Inc., Lock Haven Mill, and the New York and Pennsylvania Co., Inc., Castanea Mill.

◆

COMPLETE FILES GERMAN-JAP PATENTS NOW MADE AVAILABLE BY THE APC

Alien Property Custodian James E. Markham has announced that complete files of patents seized from German and Japanese nationals are now available in the patent departments of the Chicago and Boston Public Libraries and at the APC's San Francisco office.

The files are located in the main building of the libraries, he said, and are arranged according to Patent Office classification to facilitate searching.

The APC patent libraries were transferred to the public institutions as a result of the closing of APC patent division field offices in those two cities, Mr. Markham explained. The APC patent library located in the Los Angeles Public Library has also been closed, he said.

Patent libraries are maintained by the APC at its Washington office in the National Press Building, its New York office at 120 Broadway, and now at its San Francisco office at 417 Montgomery Street.

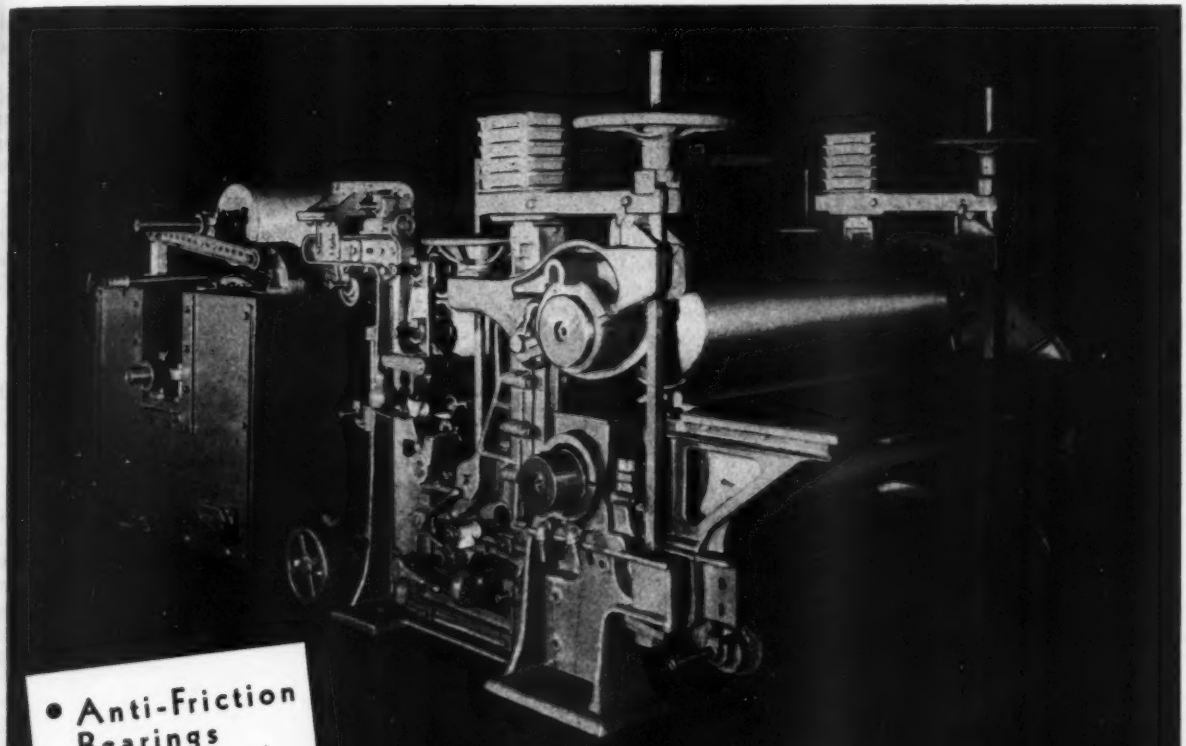
Abstracts of the patents seized by the APC are still available and may now be obtained from the Office of Alien Property Custodian, National Press Building, Washington 25, D. C., instead of from the APC's Chicago office. The abstracts, covering 8,000 chemical patents, are available for $25.00 and obstracts of 37,000 mechanical and electrical patents are

80%

OF ALL CHEMICAL PULP MADE ON THIS CONTINENT IS PROCESSED AT SOME STAGE OF ITS MANUFACTURE IN EQUIPMENT BUILT OR LINED BY STEBBINS.

Let us demonstrate the superiority of Stebbins lining and tile tank service the next time you line a new vessel or reline an old one.

Stebbins Engineering and Manufacturing Company
EASTERN BOULEVARD, WATERTOWN, NEW YORK



- Anti-Friction Bearings
- Fine Control
- Precise Formation

Sandy Hill Paper Making Wet Machine

For the production of high grade electric and insulation boards, stereotype matrix board, binders board, shoe boards, truck board, and leather board to the fine specifications demanded by these and other similar wet machine products.

The paper making vat is designed with carefully calculated inflow compartments, a well designed circle and an adequate overflow. Cylinder mould, rubber covered couch roll and press and felt rolls are carried on anti-friction bearings. Scofield Venturi Suctions for water removal and Scofield Felt Conditioners are provided.

A movable cylinder mould vat is an alternate for the standard paper board vat. With this attachment the cylinder mould may be moved in relation to the circle 3" in any direction from a central setting. This controls the flow of stock through the vat to a finer degree than other devices now offered to the trade.

Precision control of formation and caliper is the basic principal of the design of this machine.

From a Simple Casting to a Paper Machine . . .
Sandy Hill Serves the Industry Completely!

THE SANDY HILL IRON & BRASS WORKS
HUDSON FALLS, N. Y.

available at the same price. The chemical abstracts have been prepared in 34 volumes available at a dollar each while abstracts of mechanical and electrical patents are available in each of over 300 Patent Office classifications at prices ranging from ten cents to one dollar.

◆

EXPANSION PLANNED FOR GULF STATES PAPER CORP.

Following a recent board meeting, announcement was made by Gulf States Paper Corporation, Tuscaloosa, Alabama, of plans for the expansion of the plant which will effect a production increase of 50 to 75 per cent.

Mrs. Mildred Warner, president of the company, states that Willis Penfield, a vice president, will direct the expansion program which will get under way as soon as possible and will involve an expense of several million dollars. The program includes a new paper machine, other plant equipment, and the building of several additional buildings one of them being an administration building.

◆

CANADIAN NEWSPRINT MFRS. INCREASE PRICE $6.80 A TON

On July 11 the major Canadian newsprint producers sent notices to their customers announcing an increase of $6.80 per ton in the price of newsprint.

The rise to be added to the standard New York price of $67 per ton was said to have been ordered to meet the loss which Canadian manufacturers faced as a result of last Friday's change in the value of the Canadian dollar. With the American and Canadian dollars now at par, the manufacturers will lose the 10 per cent premium on the New York price, which they had been getting since September, 1939.

◆

UNION BAG TO BUILD NEW BAG PLANT IN SAVANNAH

Plans for the construction of a new box plant in Savannah (Ga.) were announced by Union Bag & Paper Corporation on July 12.

The new plant which will provide a fully integrated operation from wood pile to kraft corrugated shipping containers, will be of brick and steel construction and will cover an area of approximately 160,000 square feet.

As soon as building permits are cleared, ground will be broken for the new building which will be adjacent to the company's huge bag-making plant in Savannah. Alexander Calder, company president, states it is hoped that operations will be under way shortly after the first of the year.

▶▶▶ A MACHINE to increase the capacity of the Alton Box Board Company, Alton, Illinois, will be installed and ready for production late in 1947. The machine ordered is a 7-cylinder board machine 216 inches wide, trimming a sheet approximately 200 inches wide. The new machine is designed to produce between 300 tons and 500 tons per day, depending on the grade and weight of the board.

◆

▶▶▶ CONSTRUCTION OF a $50,000 project has been started by Western Waxed Paper Company, a subsidary of Crown Zellerbach Corporation, Portland, Oregon. The building will increase the Portland plant's capacity about one-third, and will be completed in two years.

◆

▶▶▶ THE WET ROOM of the Peavey Paper Company, Ladysmith, Wisconsin, collapsed into the Flambeau River on July 4. The reason given by William Peavey, president of the company, was that the river had undermined the walls of the two-story steel and concrete annex. Some machinery was lost, but since it was a holiday and the mill was closed, there were no casualties.

◆

▶▶▶ THE NEW CARTON PLANT of United Paperboard Company, Springfield, Ohio, began operations late in June. The Springfield plant, which has been equipped with machinery and equipment moved from the company's Urbana (Ohio) carton plant, is two-thirds larger than the Urbana plant.

◆

▶▶▶ PLANS FOR REBUILDING the Putney Paper Company mills at Putney, Vermont, which were burned recently, are under way. The Green View Tissue Company which occupied the same building, has set up temporary quarters in another building.

◆

▶▶▶ A TRAINING PROGRAM for pulpwood cutters is in progress at Stag Hollow Camp, Jefferson, New Hampshire. Trainees are being taught the proper use of tools, how to file and set a saw, and instruction is being given in safe and efficient cutting methods. Lawrence Conway is in charge of the program.

▶▶▶ THE SIX-MONTH Calendar distributed semiannually by Bermingham & Prosser Company, Chicago, carries a theme of "education" for the second half of this year. Each page carries a gem of thought from some great man from the days of ancient Greece down to our own era. This fine calendar, bearing the peacock motif, has become emblematic with B & P company, and those who are privileged to receive them, look forward to these artful reminders.

◆

▶▶▶ GAUGE GLASSES, useful to pulp and paper mills in connection with engines and boilers, are offered in a Navy Sales Catalogue to be distributed this month. Copies of this catalogue may be obtained by addressing: Supply Officer in Command, Naval Supply Depot, New Orleans 15, Louisiana. Refer to No. L11-4, NT4-60 (SD) Serial No. 102414.

◆

▶▶▶ THE CENTENNIAL celebration of the founding of Perkins- Goodwin Company was marked by an evening at the Waldorf-Astoria Hotel in New York City. Nearly 700 guests enjoyed the cocktail hour, dinner and dancing. Special tribute was paid to Louis Calder, president of Perkins-Goodwin, who started with the company as an office boy fifty years ago, and who has been its president for nearly a quarter of a century.

◆

▶▶▶ FOR THE FIRST TIME since 1940, traffic with Atlantic ports was resumed when the SS *Cedarton* arrived at Rochester, New York, with 700 tons of newsprint from Bowater's Newfoundland Pulp & Paper Mills. Ltd., Corner Brook, Newfoundland. In addition to the Rochester shipment, about 600 tons were delivered at Oswego, New York.

◆

▶▶▶ SOMETHING NEW in the way of large-quantity recipes has been offered in a neat little package entitled Quantity Recipes for Paper Service. This innovation has been put out by the Public Health Committee of the Paper Cup and Container Institute, New York City. There are twelve recipes each printed on a separate card, punched so that it can be hung within easy reading distance. A feature of each recipe is a statement as to the correct paper cup or container to be used. These recipes might be of interest to industrial cafeterias, schools or other institutions. Requests should be made on letterhead to the Institute, Room 806, 1790 Broadway, New York 19, N. Y.

Pulp Washers in Bleach Plant—Southland Paper Mills, Inc., Lufkin, Texas

You can do All Paper Processing Jobs Better . . . with Reliance V★S Drive

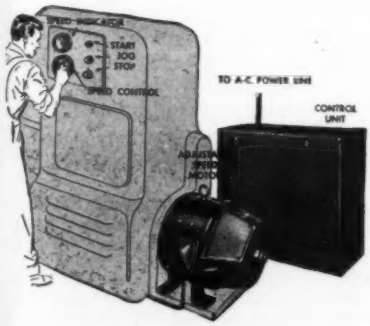
V★S, the *All-electric, Adjustable-speed Drive operating from A-c. Circuits,* provides unlimited flexibility of machine operation. Easy and instant control of speed assures the most efficient operating rate for any material. Starting, stopping and speed changing are smooth and can be controlled manually or automatically, from nearby or remote stations.

Conveniently-packaged, space-saving V★S Drives are available in either Rotating or Electronic Systems or a combination of both systems.

From the vast number and variety of V★S applications in the paper industry comes proof that this drive will help *you* increase production and reduce operating costs wherever a range of speeds is required. Write today for Bulletin 311 which gives further important facts about V★S Drive.

RELIANCE V★S DRIVE

THE ALL-ELECTRIC ADJUSTABLE-SPEED DRIVE for A-c. Circuits



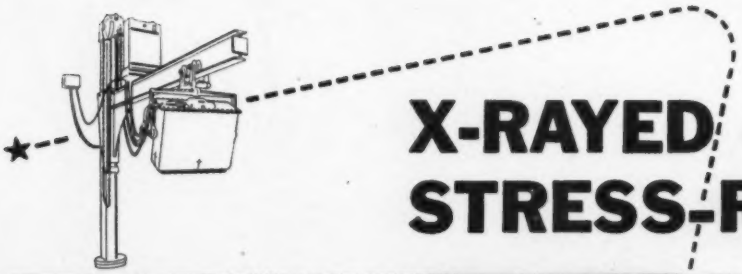
RELIANCE ELECTRIC & ENGINEERING CO.

1078 Ivanhoe Road • Cleveland 10, Ohio

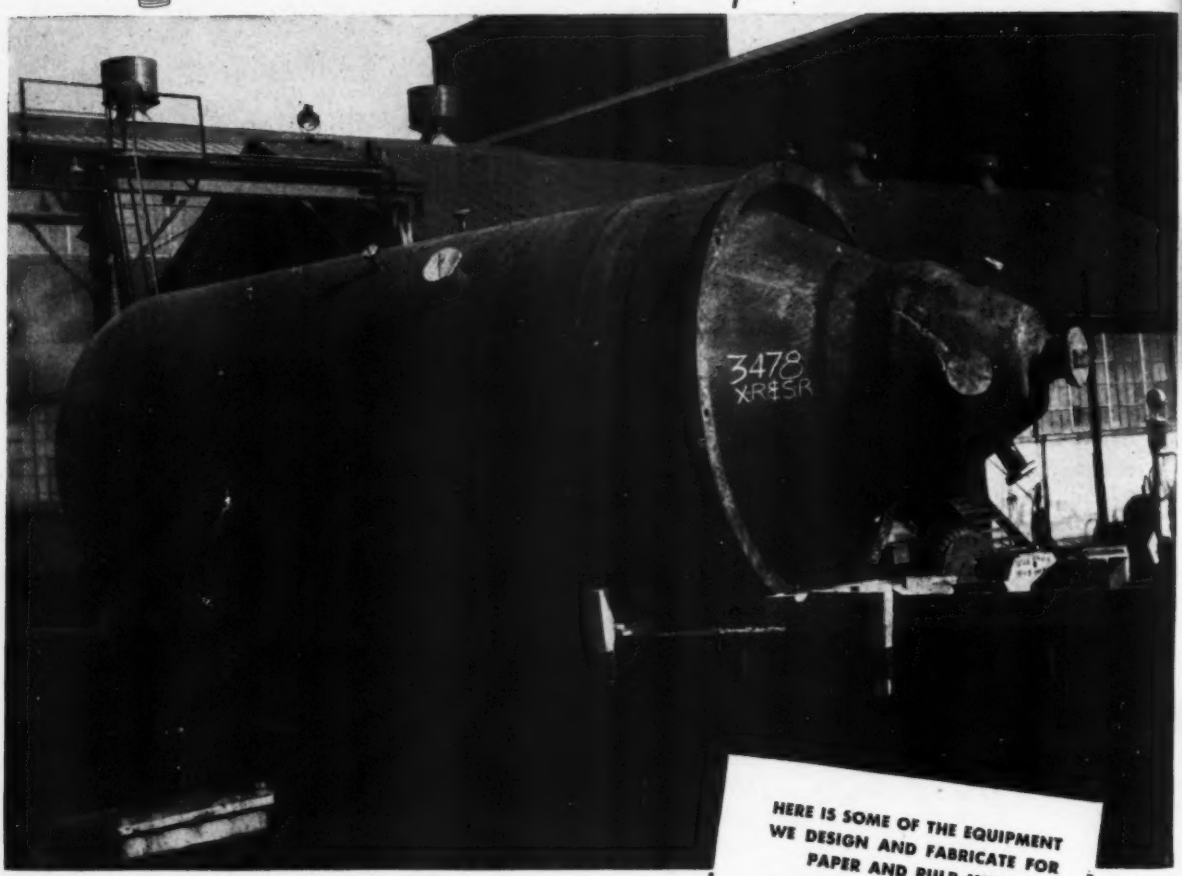
Birmingham • Boston • Buffalo • Chicago • Cincinnati • Denver • Detroit • Gary Greenville • Houston • Kalamazoo • Kansas City • Knoxville • Los Angeles Milwaukee • Minneapolis • New Orleans • New York • Philadelphia • Pittsburgh Portland, Ore. • Rockford, Ill. • St. Louis • San Francisco • Seattle • Syracuse Tampa • Tulsa • Washington, D. C.

RELIANCE A-C D-C MOTORS

"Motor-Drive is More Than Power"



X-RAYED and STRESS-RELIEVED



THE view above shows one of four 10 ft. diam. by 31 ft. digesters built in our Birmingham plant for a paper mill in India. Digesters are typical of the steel plate work we fabricate for pulp and paper mills. All three Chicago Bridge & Iron Company plants have facilities for X-raying and stress-relieving vessels in accordance with code requirements. Tanks and steel plate work used in the manufacturing processes at sulphite pulp mills often require corrosion-resistant alloys. We can furnish tanks with special linings when mill conditions require it. All of the equipment we furnish to paper and pulp mills is designed and fabricated specifically for the job.

HERE IS SOME OF THE EQUIPMENT WE DESIGN AND FABRICATE FOR PAPER AND PULP MILLS

- Sulphate Digesters
- Sulphite Digesters
- Diffusers
- Hortonspheres
- Cylindrical Tanks
- Cyclones
- Flat-Bottom Storage Tanks
- Steel Smoke Stacks
- Salt Cake Bins
- Cookers
- Elevated Water Tanks
- Welded Steel Pipe

CHICAGO BRIDGE & IRON COMPANY

Chicago, 4.....2445 McCormick Building
New York, 6.....3350-165 Broadway Building
Cleveland, 15.....2267 Guildhall Building
Los Angeles, 14.....1459 Wm. Fox Building
Birmingham, 1.....1511 North 50th Street
Atlanta, 3.....2143 Healey Building
Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PENNA.

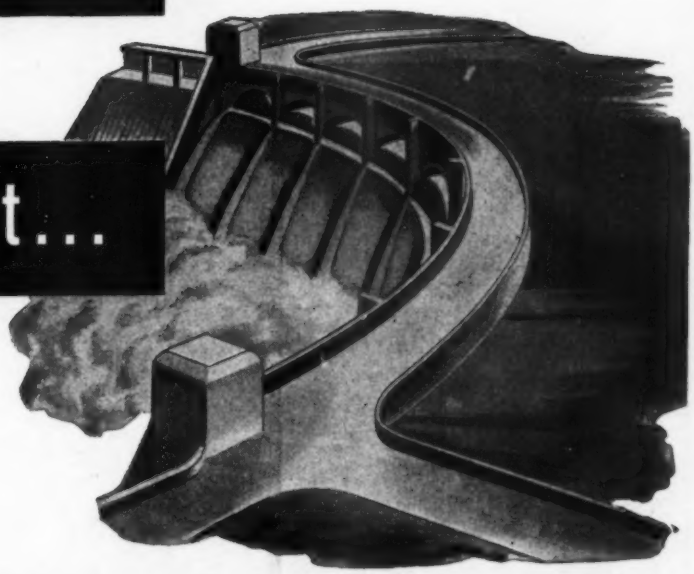
Tulsa, 3.....1651 Hunt Building
Houston, 1.....5643 Clinton Drive
Philadelphia, 3.....1653-1700 Walnut Street Building
Washington, 4.....703 Atlantic Building
San Francisco, 11.....1217-22 Battery Street Building
Detroit, 26.....1566 Lafayette Building
In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

WORLD'S LARGEST PRODUCER OF SYNTHETIC RESINS

RCI

two water barriers

you can trust...



for wet-strength paper

P426 BECKAMINE

for water-resistant adhesives

P364 BECKAMINE

P-426 Beckamine—A urea-formaldehyde resin which heightens wet-strength and also increases tensile strength, fold and mullin. Can be applied in the beater, fan pump or head box or directly to the sheet at the size press. Exceptionally stable, too.

P-364 Beckamine—A low-cost resin for V-Board adhesives imparting exceptional water resistance. Low formaldehyde content minimizes unpleasant fumes in formulating. Available in any quantity. For details write the Sales Department at Detroit.

REICHHOLD CHEMICALS, INC.

General Offices and Main Plant, Detroit 20, Michigan

Other Plants:
Brooklyn, New York • Elizabeth, New Jersey • South San Francisco, California • Tuscaloosa, Alabama • Liverpool, England • Paris, France • Sydney, Australia

SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • INDUSTRIAL CHEMICALS

The Secret of the Wasp

One day in 1719, a French scientist, René de Réaumur, while out for a walk, paused to watch some wasps building their nest. He noted that they chewed up bits of wood, then pressed the pulpy mass into layers that looked amazingly like paper! Pondering this discovery, he informed the French Royal Academy: "The wasp seems to invite us to try whether we cannot make fine and good paper from the use of certain woods."

Alas, no one accepted the invitation for 131 years. Then Frederick Kellar in Germany, recalling de Réaumur's suggestion, devised a machine for grinding wood. Other pulping processes were developed by Hugh Burgess in England and C. B. Tilghman in America. Soon paper from wood—cheap and plentiful paper—multiplied a thousand-fold the means of spreading the printed word. Long delayed, the secret of the wasp awoke a waiting world.

The dramatic story of paper is told in the sound-and-color film, "Paper—Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

F. C. HUYCK & SONS · *Kenwood Mills* · ALBANY, NEW YORK

KENWOOD WOOL PRODUCTS

HUYCK *Felts*

PLACE A double guard ON THE QUALITY AND UNIFORMITY OF YOUR PRODUCT

In production . . . in laboratory control . . . let B&A Reagents and Fine Chemicals stand "double guard" over the quality and uniformity of your product . . .

As raw materials, for example, B&A Fine Chemicals offer an extra measure of purity not obtainable in ordinary process chemicals. With them, you can build quality into your product right from the start. With them, you may find, too, that purification processes can frequently be avoided or cut to a minimum, and manufacturing costs can be reduced.

For chemical control, B&A Reagents are always thoroughly dependable and reliable . . . "precision made" to decimal-point accuracy for your most exacting analyses. With them, you work in certainty . . . protecting your product every step of the way until it comes "off the line" worthy of your guarantee.

So, when quality counts, be sure! Specify General Chemical B&A Reagents and Fine Chemicals for *every* possible operation . . . in production . . . in chemical control . . . in the research laboratory!

Setting the Pace in Chemical Purity Since 1882

BAKER & ADAMSON Reagent and Fine Chemicals

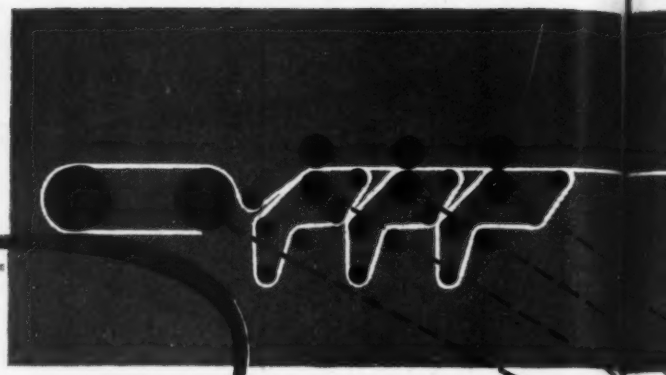
Division of GENERAL CHEMICAL COMPANY, 40 Rector St., New York 6, N. Y.

Sales and Technical Service Offices: Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo Charlotte • Chicago • Cleveland • Denver • Detroit • Houston • Kansas City • Los Angeles • Minneapolis New York • Philadelphia • Pittsburgh • Providence • San Francisco • Seattle • St. Louis • Utica Wenatchee • Tulsa (Inyokern)

In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

New



MULTIPLE-GENERATOR SECTIONAL DRIVE

...helps you maintain higher running speeds,

...reduce spoilage losses,

...increase production

Here's the newest development in sectional paper-machine drives, designed by G.E. to help you boost output and reduce costs. It's a multiple-generator sectional drive and it's *simple to install, simple to operate,* and *simple to maintain.* Thanks to more than five years of war-accelerated development in the design and application of electronics and amplidynes, G.E. now brings you smooth, constant paper speed and tension control at less cost. Your machines can operate at higher running speeds—you can reduce spoilage losses—you can increase your output.

Easy to install

The controls for each section of a G-E multiple-generator drive system are separately "packaged" in modern panels and completely assembled in our factory. They require no extensive adjustments or checking of interlocking circuits.

Power and control wiring is much simpler than that used in older drives because no intricate controls are needed for interlocking relays with other section-control panels.

Easy to operate

You can start several section drives simultaneously, each drive coming up to a preset speed quickly and smoothly. Load or draw changes in any one section do not disturb adjustments in other sections.

Draw adjustments for any single section are easily obtained by means of a small rheostat. Slack take-up is easily accomplished without affecting draw adjustments. Response to speed and load changes is so fast that over-correction, unavoidable with slower mechanical regulators, is eliminated.

Easy to maintain

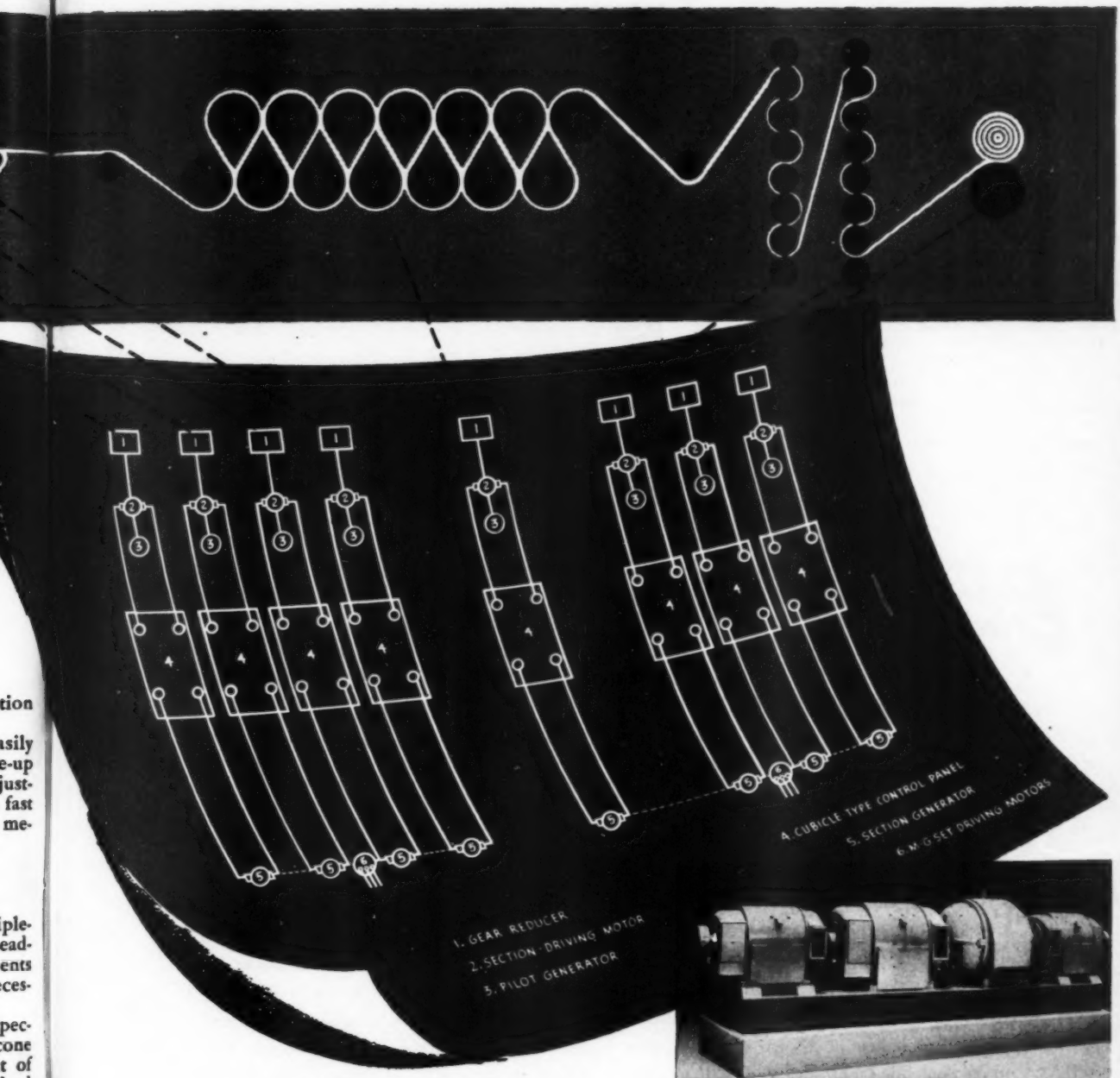
All wiring and control devices in a G-E multiple-generator drive are incorporated in simple, dead-front cubicles, all of which have identical contents and arrangements except for minor differences necessitated by varying ampere ratings.

The electronic speed regulator requires little inspection and maintenance for there are no gears, cone pulleys, or other mechanical devices to get out of order. Replacements are limited largely to standard inexpensive electronic tubes.

"Down time" for wash-up, inspection and maintenance of the paper machine itself is greatly reduced because each section drive can be jogged or operated at slow speed simultaneously with or independently of other sections.

First to build a multiple-generator sectional drive for paper machines, G.E. continues to pioneer in the design and engineering of efficient, low-cost paper-mill drives. Other improved drives have already been developed for chippers, grinders, stock-preparation machines, super-calenders, and winders. Why not consult your nearest G-E sales engineer now while your plans are still in the formative stage? *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

PAPER-MILL *Drives*



G-E MULTIPLE-UNIT MOTOR-GENERATOR SETS *are sturdy, give long, reliable service and require no more than routine maintenance check-up.*

In a G-E multiple-generator sectional drive, the drive for each section is, in effect, a complete and independent system. Each section motor is powered by its own adjustable-voltage generator whose output voltage is varied to give precise control of the speed of each section. There is no connection between individual section controls except for a stable reference voltage feeding the electronic-pre-amplifier in each control panel. The multiple-generator system permits an adjustable-voltage drive to perform to its best advantage by operating only on generator voltage control without change in motor-field excitation, thereby giving full motor-torque efficiency under all operating conditions.

THE MULTIPLE-GENERATOR CONTROL PANELS *are steel enclosed in dead-front cubicles that protect personnel and equipment, yet are easy to inspect. They can be installed individually or in groups.*

GENERAL ELECTRIC

BETTER STEAM ENGINE PERFORMANCE

FOR more efficient, dependable and economical performance, use a steam cylinder oil that's *right* for your particular operating conditions. Texaco has a complete line of steam cylinder oils to meet every requirement.

You'll find that the Texaco steam cylinder oil recommended for your engine will atomize completely and adhere to cylinder walls. This is your assurance of reduced cylinder and piston wear, of extra protection for all vital parts, and greater all-around efficiency.

If you use your exhaust for processing, you can get Texaco oils especially designed to separate rapidly from exhaust or condensate.

Texaco Lubrication Engineers will gladly help you select the most effective oil to assure the best operation of your steam engine. Just call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Steam Cylinder Oils

FOR EVERY STEAM CONDITION

TUNE IN TH: TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

EDITORIAL

The New OPA

▶▶▶ IT IS TOO EARLY to evaluate the effects of the OPA bill which Congress finally passed and sent to the President. He signed it "reluctantly" as well he might, for all the lawyers in Philadelphia are unable to make any sense out of its multitude of contradictions and inconsistencies and its total lack of conformity to any known rules of sane jurisprudence.

The OPA as formerly set up is in process of dissolution under the present bill, for the administration of it is taken from the control of a sole administrator, empowered to make decisions, and split up between a de-control board of three and the Secretary of Agriculture.

The multitude of serious problems of applications and new interpretations must be explored and solved before industry can proceed with any confidence. This requires time—plenty of it.

In the meantime, what is industry to do while it awaits the necessary reconciliation of all the many disputable provisions of this new bill?

The new bill ostensibly provides for a roll-back of price ceilings in effect on June 30, 1946. But factually, will that be the result? Manifestly, the June 30, 1946, ceilings were those provided by the former bill, the provisions of which have in many cases been abrogated by provisions in the new bill. Hence, will there be a general reversion of prices back to the June 30 basis?

We fear not, for the reason that business of this great country must continue to function as it is and was when the warring New Deal factors concluded their compromise fight. Manifestly, under the new bill, the OPA will have to move, and move fast, within the limits of the restrictions placed upon it by the new statute. Until then, what will most probably happen is that commerce and industry will adopt the safest, sanest course and continue to carry on at present price bases until understandable reconciliations are issued and accepted. As the concensus of opinion appears to be that the "whole thing is a mess," operations nation-wide will hold the present line until someone clears up "the mess."

One thing appears definitely assured—the OPA employees—34,000 of them—will get their pay as of July 1, 1946, forward until June 30, 1947. However, we note that the appropriations for the OPA in this fiscal year have been limited to $75,000,000, a cut of 33-1/3 per cent from former allowances. Some day the citizens of this country will awaken to the fact that they have been taken for a new deal bureaucratic financial ride in extending OPA for a year even at reduced cost. There is no place in the economy of this country for Government control of prices in peacetime.

The paper industry has given the country a fine exhibition of sane self-control during the weeks that OPA was nonoperative. And this has been particularly noteworthy because no other industry in the country faces greater problems of raw material supplies than does the paper industry. Freed from price control, all these problems can be worked out for the good of the consumers, but under bureaucratic price control, full resumption of unrestricted production cannot be obtained. Inflation is not prevented by restriction of production through price control, but by freedom of production from any price control, save that of free competition.

Freight Car Shortage

▶▶▶ THE PULP AND PAPER industry of the United States represents one of our railroad's most important customers. Its use of freight cars when looked at from an over-all annual picture is little short of phenomenal.

A review of some railroad statistics as published by the Interstate Commerce Commission and tabulated herewith in adapted form reveal that 481,433 cars were used to handle 13,447,549 tons of paper and paperboard from loading points within the U. S. in 1945. The figures cover newsprint; printing paper; paper bags and wrapping paper; paperboard, pulpboard, and wallboard; and building paper and prepared roofing materials. The railroads, therefore, handled a paper and paperboard tonnage in 1945 that represents 77 per cent of the total production for the year. The total production amounted to 17,370,965 tons.

According to a well-known traffic authority in the industry, there are, on the average, four cars of inbound freight to one car of outgoing freight from a pulp and paper mill. Using this figure as the basis of a simple arithmetical calculation, and assuming that the carloading previously mentioned originated at the mills, there were (481,433x4) or 1,925,732 cars of inbound freight to U. S. pulp and paper mills during 1945. The total number of incoming and outgoing cars for the year then would total (481,433 plus 1,925,732) or 2,407,165.

Some U. S. Pulp and Paper Freight Car Statistics — 1945
(Loads originating in U. S.)

Item	Number of Carloads	Tons of Freight	Tons per Car
Newsprint	36,629	1,053,087	28
Printing Paper	83,411	2,372,872	28
Paper Bags and wrapping paper	89,211	2,445,709	27
Paperboard, pulpboard, and wallboard (paper)	92,700	2,796,971	30
Coal (anthracite)	.....	.....	57
Coal (bituminous)	.....	.....	57
Lime	.....	.....	39
Pulpwood	508,837	20,155,019	40
Sulphur	.....	.....	59

Adapted from data in Freight Commodity Statistics published by Interstate Commerce Commission

On a 365-day year, it means the use of about 6,600 cars a day.

Today, there is definitely a shortage of freight cars. It has been reported that as of May 1, 1946, there were 36,898 fewer freight cars in service than on May 1, 1945. Old cars are just wearing out faster than they are being replaced.

To get the most out of the cars in service demands that every user of rail transportation co-operate with the railroads in every possible way to expedite car movements.

Here are some suggestions for doing this very thing that were included in a recent release of the American Paper and Pulp Association:

1) Load all cars to capacity.

2) Order only the number of cars required for immediate loading. Under

(Turn to next page)

CURRENT THOUGHT

Harold Was a Bit "Icky"

WILLIAM SIBLEY

▶▶▶ SHORTLY BEFORE he vacated his office of Secretary of the Interior last spring, Harold Ickes made the astounding statement that: "The prodigal harvest of minerals that we have reaped to win this war has bankrupted some of our most vital resources. We no longer deserve to be listed with Russia and the British Empire as one of the 'Have' nations of the world. We should be listed with the 'Have Nots' such as Germany or Japan."

Can you imagine any guy in high office spouting such hog-wash?

The reason he gave for his lugubrious contention was based on the estimated fact that the minerals used in the manufacture of all forms of armament during the four years of war, plus the fuels required to propel them to and on the battle fronts in every part of the world had amounted to the staggering figure of being one-fourth of the total of such materials that were produced since 1880, or, roughly, the entire span of the modern industrial life of the United States.

Well, I am in no position to quarrel with that statement. It may be entirely accurate or even conservative for all I know. But when Mr. Ickes and other so-called authorities claim that the result of this profligate wartime expenditure is that there are only nine major vital products with reserves sufficient to last 100 years, I want to raise my voice in protest. Especially when those nine products are listed as nitrogen, magnesium, salt, bituminous and anthracite coal, phosphate rock, molybdenum, potassium and iron ore.

The pessimists make their mistake in thinking of the economy of the United States as a static one and viewing present conditions as incapable of change. For them, the age of progress has come to an end, the last frontier has been crossed, and there are no more discoveries to be made either in the earth's crust or in the skulls of scientists.

The truth is that the United States has been so gifted by nature that in the past she never had to bother except to take the cream off her resources. Only her high grade ores have been exploited. Indeed, with the limited stage to which technological processes had advanced, only her high grade ores were worth exploiting profitably.

When both salt and magnesium are extracted from sea water, (and there being little likelihood of the oceans drying up) any prediction of exhaustion in something like 100 years borders on the slightly silly. As for bituminous coal, the American Mining Congress states that while our annual consumption runs about 600 million tons annually, the known reserves of three trillion five hundred billion tons will keep the U. S. in coal supply, at the present rate of consumption, for some 6,000 years to come. As for iron, the Mesabi range alone will keep us going (at present rate of consumption) for twenty years, while the known resources elsewhere of 276 billion tons will keep this country supplied with iron ore for nearly 5,000 years.

Now, let's take a peak at petroleum — a basic essential whose exhaustion has been predicted within 20 years. This dire outlook is based on the fact that the U. S. has thus far extracted some 28 billion barrels from our primary source of supply, leaving only about 20 billions remaining. At present rate of consumption, this is sufficient for only about 15 years.

Does that means that somewhere between 1960 and 1965 our automobiles, 10-ton trucks, and airplanes will become museum pieces; that we will go back to horses and hire a new gang of white wings? By no means. Discarding the probability, or even possibility, of new discoveries, we have in known reserve some 500 billion barrels of oil in shale deposits—which with present consumption will stave off the gentle horse for 350 years.

Every generation saw the geographical center of the lumber industry move some 500 miles further on from Maine, to Virginia then to Michigan, etc., leaving behind everywhere pathetic lumber ghost towns. When the center had reached the Pacific Coast States it was suddenly realized that one of the country's richest assets was in danger of exhaustion, after which the country would have to import lumber, which it could produce itself if it only altered its practices.

A change of policy was instituted and now lumber is treated as a crop with scientific replanting proceeding simultaneously with the scientific selective cutting of standings. Experts now generally agree that the United States need have no fear for its future lumber supplies, even if the present plans of replanting some 76,740,000 acres of old forest land, now unproductive, do not materialize.

In the case of metals, conservation plans are in their infancy. They practically are confined to the recovery of scrap notably in the case of iron and to a lesser extent in the case of metals used in the electrical trades. But other conservation policies are possible with the metals such as the more thorough mining of ore veins before they are abandoned.

There is no denying, however, that some products such as, tin, nickel and asbestos, for example, will, in spite of any effort, have to be sought in increasing volume from outside the United States. Even in such cases American industry can still afford to retain its optimism because any materials that she cannot provide herself are found in unlimited quantities in foreign countries that are friendly.

It all sums up that it is difficult to see why American industry should be despondent about its future. It most certainly is much too soon for it to start, as some suggest it should, to prepare its own obituary notices in expectation of an early demise.

◆

FREIGHT CAR SHORTAGE

(Continued from preceding page)

no circumstances hold cars for prospective loading.

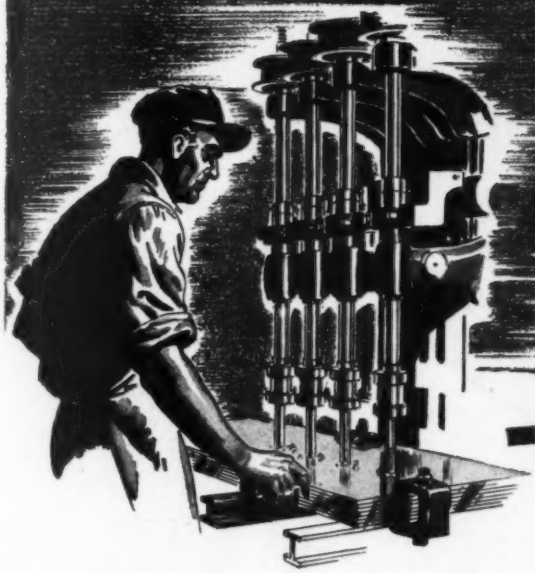
3) Consolidate shipments to utilize car capacity. As example: accumulate a carload instead of forwarding several L.C.L. shipments.

4) Unload cars promptly upon receipt and release to the railroads without delay equipment that is not immediately reloaded. *Before release remove all dunnage and debris.*

5) Where practicable the extra hours offered by Sundays and holidays should be fully utilized to make cars available for release or reloading.

6) Analyze your routings. This is a very important step in saving car days. The use of several carriers in your routings, which means the cars would reach destination one or two days later than via the direct routes, should not be permitted to interfere with the efficient use of transportation. Thousands of car-days can be saved in this manner.

Need Advice about Machining Stainless Steel?



-ask EASTERN!

Stack Drilling? What drill feed should be used in drilling ⅜-in. holes through clamped stacks of 20-gage, E-S 18-8 Mo stainless (Type 316) sheets?

Bevel Milling? In beveling E-S 18-8 low-carbon stainless (Type 304) plate edges before welding, must we decrease the speed or feed of the milling cutter as the cut widens?

Hole Size for Tapping? What diameter reamer should be used on holes in titanium-bearing E-S 18-8 plate (Type 321) to be tapped for ¼"-32 threads?

Saw Tooth Set? Is any special set required in the teeth of a band saw for cutting light-gage E-S 18-8 stainless sheet (Type 302)?

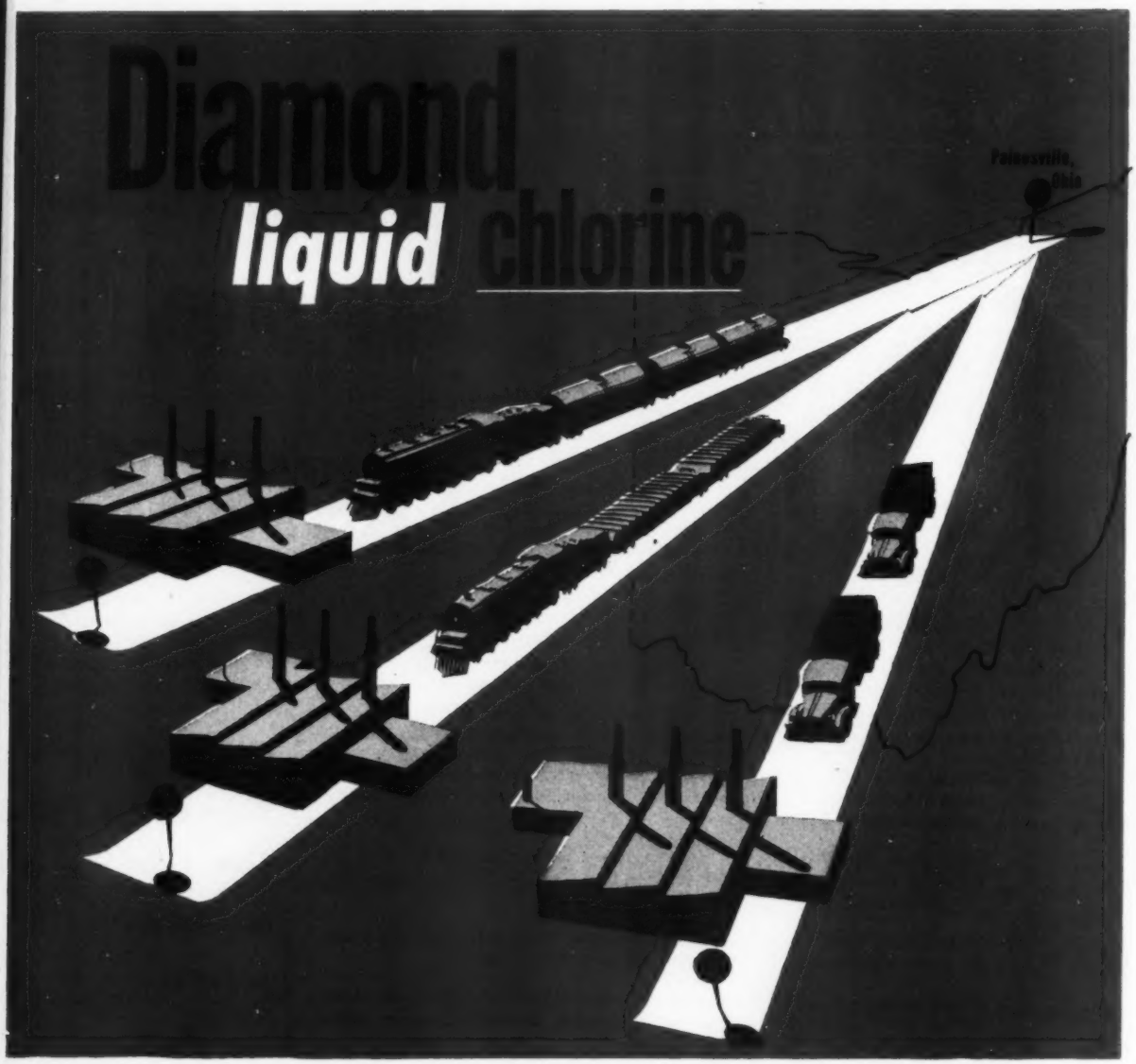
Punch-Marking? Can we punch-mark drill holes in E-S 18-8 chrome-nickel plate (Type 304)? What is the best way to start holes at an angle with this plate?

Counterboring? Is reaming likely to harden E-S 17-7 Stainless (Type 301) so much that counterboring is difficult? What is the remedy?

Machining stainless, like handling any other important metal, requires the right technique. When you know how, it is simple. When you need help, get in touch with Eastern. Eastern technical men have worked with stainless so much that they have the right advice at their fingertips. There is a lot of good advice, too, in Eastern's booklet, "Eastern Stainless Steel Sheets." A copy is yours for the asking. JMLee E-E1

ask Eastern for the answer when Stainless is the question

Diamond liquid chlorine



highest quality

available now

delivered in tank cars, multi-unit cars, or cylinders, as your needs require

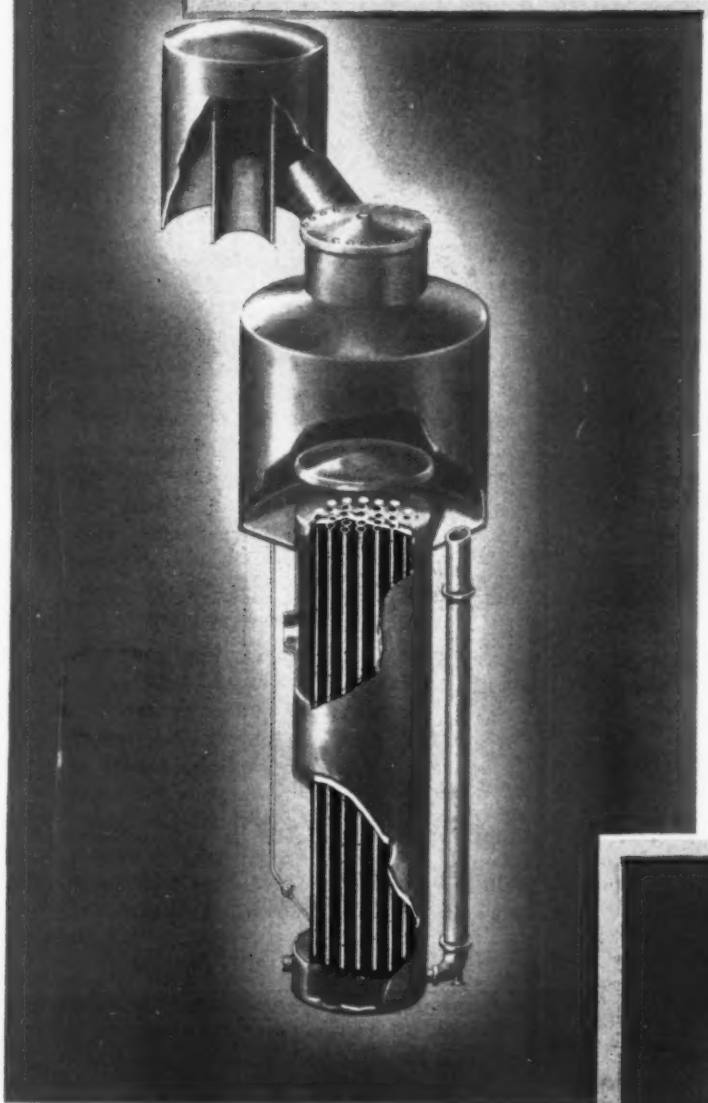
CHLORINE

Diamond Alkali Company, Pittsburgh, Pa., and everywhere

Timken 5% Nickel Alloy Tubes

SERVE LONGER

in Black Liquor Evaporators . . .



From laboratory studies, and investigations and testing under actual plant conditions, in many northern and southern mills during the last 8 years, Timken has developed 5% Nickel tubes which meet specific black liquor corrosive problems for greatly improved life-over-cost.

No other steel producer has devoted so much research to physical requirements necessary to expedite installation and assure maximum service. Studies have included causes of general corrosive attack and pitting in actual service where black liquor concentrations run over 40% solids, where liquor temperatures exceed 220 degrees F., where sulphidity of cooking liquors exceeds 25%, and where forced circulation evaporators have had thru-put increased by larger pump installations.

Timken 5% Nickel alloy tubes have uniformity of structure and are given flaring and hydrostatic tests at 1,000 lbs. per square inch.

A Timken specialist will bring you recommendations. Write Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

Fine Alloy

STEEL AND SEAMLESS TUBES

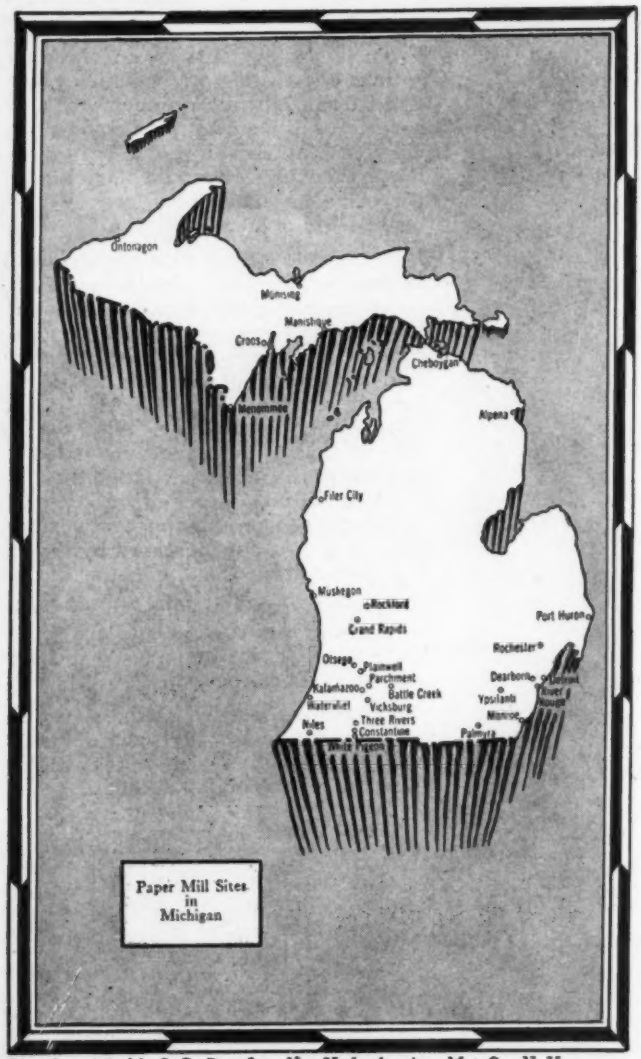
★ YEARS AHEAD — THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS in hot rolled and cold finished Alloy Steel Bars for forging and machining applications, as well as a complete range of Stainless, Graphitic and Standard Tool Steel analyses. Also Alloy and Stainless Seamless Steel Tubing for mechanical and pressure tube applications.

Draper's

ATLAS OF AMERICAN PAPERMAKING

No..19 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS



Map Copyrighted by L. D. Post, Inc., New York. American Map Co., N. Y.

HIGH LIGHTS:

Michigan ranks second among the States in tonnage of paper annually produced. She won this position by nosing into the one million ton class in 1927, is giving New York a close rub for first place, but is hard pressed by Maine and Wisconsin.

Michigan is the original producer in the United States of Mitscherlich sulphite pulp. The process patented in Germany about 1882, had been purchased by August Thilmany in 1886, who transferred the rights to the International Paper and Fibre Company. A mill was erected at Alpena by G. N. Fletcher and Albert Pack, lumbermen, under Thilmany's supervision, to utilize refuse from their lumber mills in the manufacture of Mitscherlich sulphite.

As the wood suitable for pulp was prodigally used up, Michigan lost her preeminence as a pulp producing state, but kept on gaining, nevertheless, in the manufacture of a widening variety of papers. By the importation of pulp wood and wood pulp, and by the very extensive use of refabricated waste papers, Michigan mills have kept their State out front in the papermaking race.

Michigan's annual production, exceeding one and one quarter million tons, is the fruit of 67 Fourdrinier, 46 cylinder and 10 Yankee paper machines.

Draper Felts for Efficiency

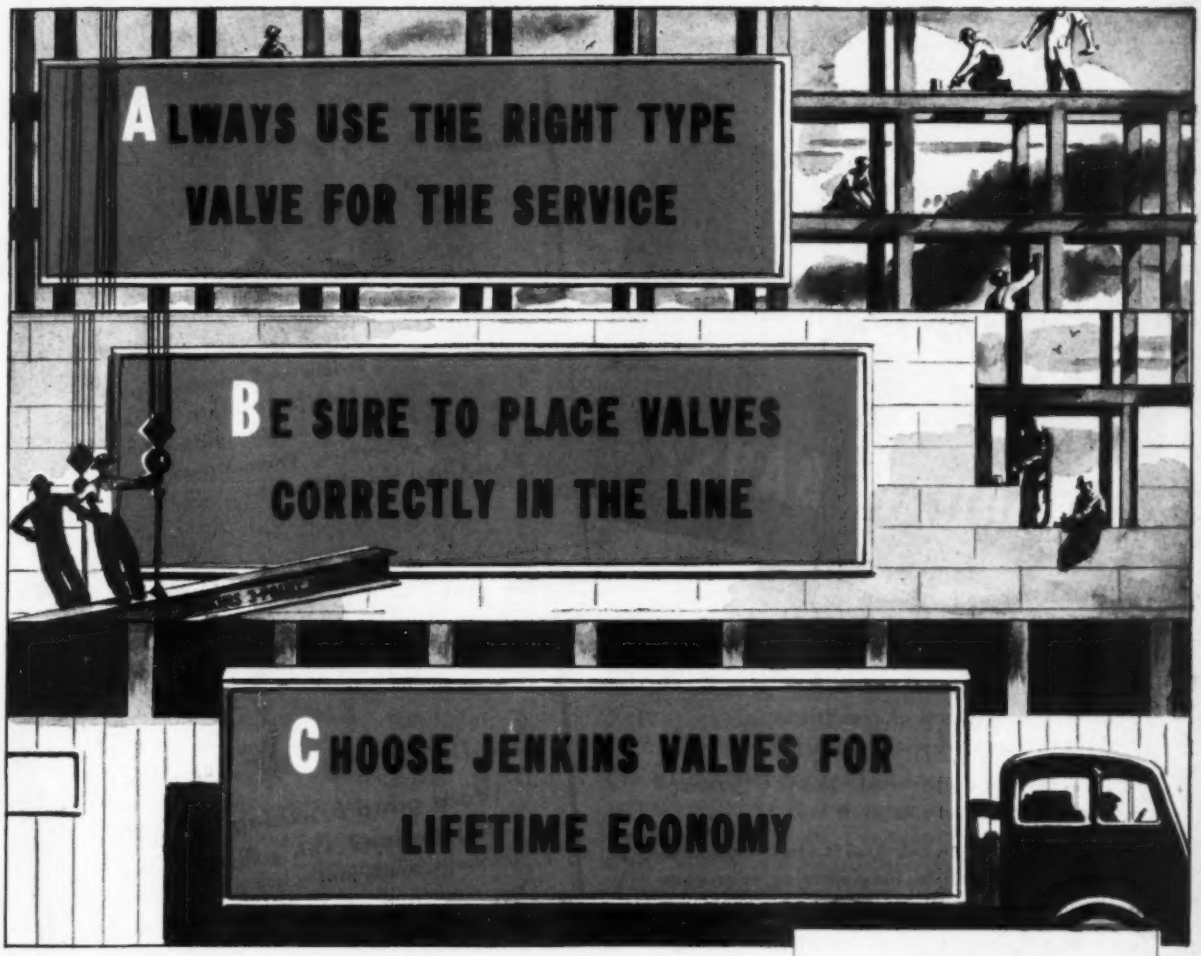
DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

Canton, Massachusetts

RALPH E. BRIGGS Sales Manager

BRADFORD WEST, PITTSFIELD, MASS. • WILLIAM N. CONNOR Jr., CANTON, MASS. • L. H. BREYFOGLE, KALAMAZOO, MICH. • W. L. CAMPBELL, SAVANNAH, GA.


ALWAYS USE THE RIGHT TYPE VALVE FOR THE SERVICE
BE SURE TO PLACE VALVES CORRECTLY IN THE LINE
CHOOSE JENKINS VALVES FOR LIFETIME ECONOMY

Getting down to earth on valve costs

The real cost of a valve depends on three factors – selection of the right pattern and metal, installation with proper care in the right location, and choice of the valve best engineered for endurance. That's why more and more plants have adopted the Jenkins 3-Point Formula as their buying guide in new construction or renovation.

By choosing Jenkins Valves you get valves made with *extra endurance* which assures *extra economy*. You also get expert advice on the selection and placement of valves from top-rated valve specialists, Jenkins engineers, whenever you need it. Base your valve buying on the 3-Point Formula. Make sure of the *extra value* that means *lowest cost in the long run.*

Jenkins Bros., 80 White Street, New York 13; Bridgeport; Atlanta; Boston; Philadelphia; Chicago. Jenkins Bros., Ltd., Montreal; London, England.

LOOK FOR THIS JENKINS DIAMOND MARK

SINCE Jenkins Bros. 1864

JENKINS VALVES

For every Industrial, Engineering, Marine, Plumbing-Heating Service . . . In Bronze, Iron, Cast Steel and Corrosion-resisting Alloys . . . 125 to 600 lbs. pressure.

Sold Through Reliable Industrial Distributors Everywhere

JENKINS Fig. 370 Bronze Gate Valve

125 lbs. Steam 200 lbs. O. W. G.

A solid wedge, inside screw, non-rising spindle type, Fig. 370 is recommended wherever a full, free flow is required. In steam service it resists pressure strains, stands up well in vibrating currents. Non-rising spindle permits use in restricted space. Can be repacked under full pressure when entirely opened.

ONE OF OVER 600 EXTRA VALUE VALVES MADE BY JENKINS *VALVE SPECIALISTS*

WHAT DO *You* WANT OF JORDAN BARS?

Three different mills . . .
three different sets of conditions . . .
three different objectives sought . . .

. . . yet the same metal—MONEL—proved highly satisfactory in each mill!*

That's not unusual. And it's not accidental. Monel is a versatile, long-wearing, corrosion-resistant nickel alloy.

Monel jordan bars are strong and extremely tough. They have high impact resistance and do not feather or chip off at the striking edge. Because the *entire surface* of the filling does its work at full capacity, an improved refining action results.

Available in 3 grades of hardness to meet varying requirements, Monel fillings may be obtained from your supplier or from any of the jordan manufacturers.

Further information, together with performance data and cost records of typical installations, will be found in our folder *Monel Jordan Bars.* Ask us to send you a copy.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

MILL No. 1

Want long life? A paper mill producing bond, ledger and mimeograph papers from bleached sulfite stock changed the woods of the plug after 11 years of service. Their Monel jordan filling lasted 13 years.

MILL No. 2

Want good brushing and cutting action? This mill makes rag content bonds and other papers from a combined rag and sulfite stock. Monel plug filling lasted 9 years, and always had good brushing and cutting action. Woods were never changed.

MILL No. 3

Want better hydrating effect? Desiring more of a hydrating effect rather than cutting action, this mill operates jordans with Monel fillings at 400 rpm. In 10 years of refining sulfate and sulfite pulps, no change of woods has been required.

MONEL

NICKEL (INCO TRADE MARK) **ALLOYS**

MONEL* • "K" MONEL* • "R" MONEL* • "KR" MONEL* • "S" MONEL*
INCONEL* • NICKEL • "L" NICKEL* • "Z" NICKEL* *Reg. U. S. Pat. Off.

striking the might from termite!

How Dowicides Forestall Destruction

Public utilities, like other efficient industries, have learned they can depend on Dowicides to keep termites and decay from eating into the profit column!

Perhaps no other enterprise must combat the enemies of wood under such adverse conditions. Wood poles, carrying communication and power lines through every kind of climate, are preyed upon by mold, decay and termites.

Maximum protection for poles (or for wood in any form) is assured by using Dowicide 7 (Pentachlorphenol). Applied at low concentrations in light fuel oil, pentachlorphenol penetrates better than higher viscosity preservatives, gives better protection than water-soluble materials. Pentachlorphenol is only slightly soluble in water and low in vapor pressure. These factors conserve its extremely high toxicity for unsurpassed effectiveness.

Choose Dowicides! Stop avoidable losses in your industry today!

DOWICIDE

germicides and fungicides

control termites mold and bacteria

DOWICIDES IN THE PAPER INDUSTRY

In paper manufacturing, Dowicides have proved their wide usefulness in combatting destructive mold. Dowicides have been found to increase wet felt life as much as 60 per cent. They also aid in slime control, in preserving log and pulp stock, in making packaging papers mold-resistant and in reducing maintenance costs.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago
St. Louis • Houston • San Francisco • Los Angeles • Seattle

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

WHAT IS YOUR

IT PAYS TO KNOW *MORE* ABOUT

HERCULES

PROBLEM?

. . . A LETTER TO HERCULES MAY GIVE YOU THE ANSWER, as it is doing for hundreds of others every month . . .

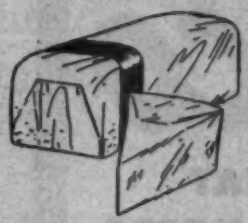
Are you seeking chemical materials that might better the quality or performance of your products, or improve their processing? If so, take a cue from the hundreds of other manufacturers who write to us every month for help in the selection and use of Hercules chemical materials.

Hercules' broad experience in the development, production, and application of terpene and rosin chemicals, synthetics, cellulose products, chemical cotton, and other chemical materials for the paper industry, can guide you toward the most effective and economical ways to employ these products.

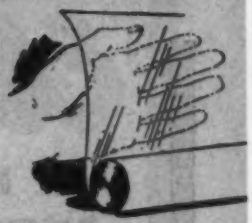
Drop us a line today, outlining your problem or mentioning the Hercules chemical materials in which you are interested. Your inquiry will receive prompt attention, no matter how moderate your needs.

*Reg. U. S. Pat. Off. by Hercules Powder Company

Hercules chemical materials for the paper industry include:

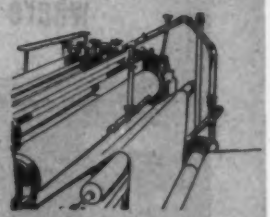


Staybelite* Esters . . .
Wax additives for coating and laminating processes, modifiers for GRS and Neoprene latices for impregnating and laminating paper and board stocks.

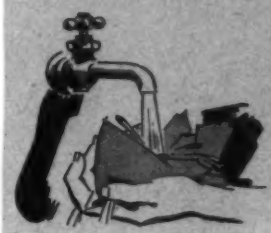


Hercolyn* . . .
A liquid resin for transparentizing. Possessing excellent fiber-wetting properties, it is useful for the production of transparent and translucent papers.

Chemical Cotton . . .
Hercules chemical cotton is a pure cellulose, in loose or sheet form. Cleanliness and brightness are outstanding.



Casein . . .
Hercules casein is used as the binder in clay-coatings, and as an adhesive in laminants and paper converting.



Paracols* . . .
Water-dispersible wax emulsions used to increase finish, flexibility, printability, and waterproofing of paper.

Chemicals . . .
These include sulphonated oils, foam killers, sweners, acids, alkalies, alum, and satin white.

FOR FURTHER DETAILS

Papermakers Chemical Department
HERCULES POWDER COMPANY
INCORPORATED
961 King Street, Wilmington 99, Delaware

Please send information on_____

_____

*Name*_____

*Title*_____

*Company*_____

*Street*_____

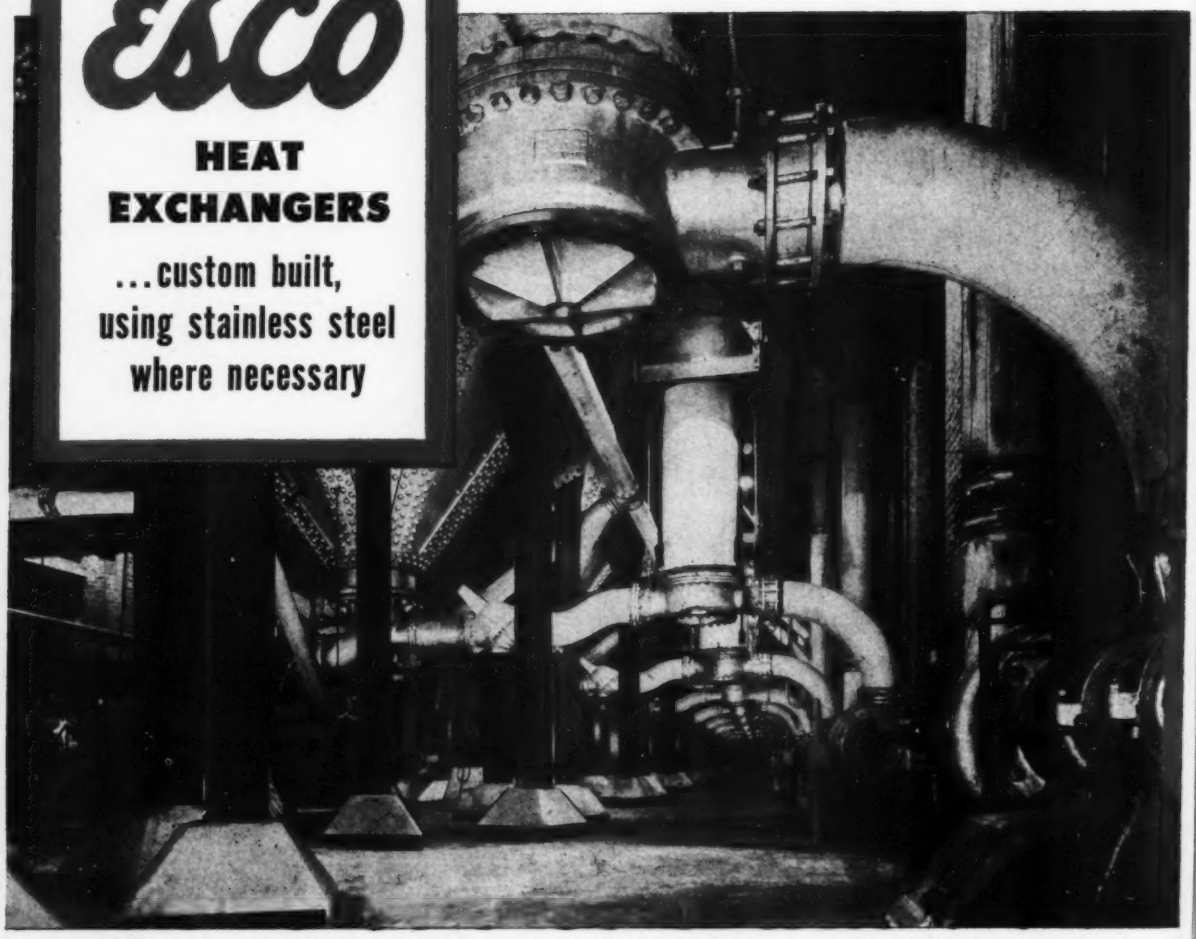
*City*_____ *Zone*____ *State*_____

EMICAL MATERIALS FOR
E PAPER INDUSTRY

ESCO

HEAT EXCHANGERS

...custom built, using stainless steel where necessary



Twelve ESCO Circulating Systems with ESCO stainless steel Heaters installed in one of the Pacific Coast's largest mills.

WHETHER the need be for heating or cooling, *ESCO* Heat Exchangers are individually designed to meet specific requirements and to pass the required Boiler Code for Pressure Vessels.

ESCO Digester Circulating System Heaters have built into them the experience of the best pulp mill engineers and technicians working with the *ESCO* engineering and metallurgical staff. As a result, *ESCO* Heat Exchangers give long dependable service, economical and trouble-free operation.

Your nearest *ESCO* representative will be glad to provide information about any pulp mill problem involving the use of stainless steel. Bulletins No. 155 "*ESCO* Circulating Systems," and No. 157 "*ESCO* Stainless Steel Products," will be mailed on request.

ELECTRIC STEEL FOUNDRY

STAINLESS STEEL FOR ULTIMATE ECONOMY

2141 N. W. 25th AVENUE, PORTLAND 10, OREGON

OFFICES AND WAREHOUSES

SEATTLE, 4 — 2724 First Ave. S. — Elliott 4161

HONOLULU, 5 — 814 Kapiolani Blvd. — Phone 6486

NEW YORK, 17 — Graybar Building — Lexington 28958

SAN FRANCISCO, 7 — 699 Second Street — Douglas 8346

SPOKANE, 8 — 121 S. Monroe St. — Main 5530

LOS ANGELES, 11 — 4600 Pacific Blvd. — Lucas 7251

CHICAGO, 1 — 221 N. LaSalle St. — Dearborn 2284

EUGENE, ORE. — 1991 Sixth Ave., W. • Phone 5012

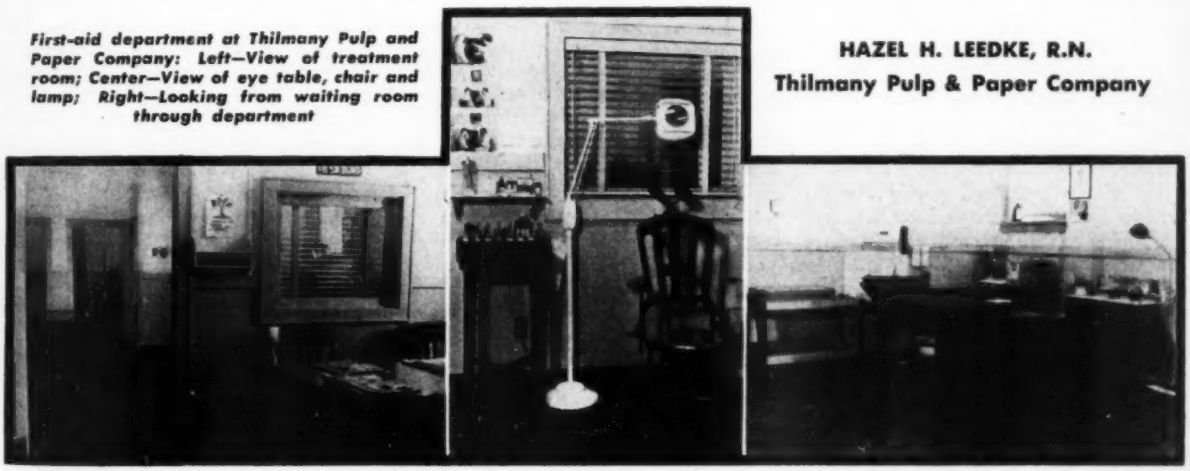
IN CANADA— *ESCO* LIMITED, 1084 Homer St., Vancouver, B. C. Telephone Marine 2343

THE PAPER INDUSTRY
and PAPER WORLD

AUGUST, 1946

The Health Program

In a Pulp and Paper Mill



First-aid department at Thilmany Pulp and Paper Company: Left—View of treatment room; Center—View of eye table, chair and lamp; Right—Looking from waiting room through department

HAZEL H. LEEDKE, R.N.
Thilmany Pulp & Paper Company

▶▶▶ FOR MORE THAN a quarter of a century, the Thilmany Pulp and Paper Company has provided nursing services for its employees. The development of this service at T. P. & P. company has paralleled the growth of industrial nursing in general. The history of industrial nursing indicates that it began in earnest as an outgrowth of various types and attempts at welfare work, usually through employee benefit associations. So did it arise from an unfulfilled need at Thilmany's. According to Thilmany's first nurse, Miss Jemima Bell, (now retired and in her seventies), her predecessor was a male welfare worker who administered the affairs of the Thilmany Employees Association. Miss Bell relates that the bringing of a nurse into the mill was such an innovation, she was advised not to wear her nurse's uniform for fear of frightening employees away from her office.

Miss Bell's work was somewhat similar to the present day program in that she administered to the sick and injured and made home calls. In fact, the original quarters of the first aid department remained housed in one corner of the storeroom, only a little more than the 8x12 originally given her, until 1940 when a modern air-conditioned three room department was constructed on the ground level of the upper mill. This arrangement offered a convenient location to employees, and facilitated access to it by ambulance and car.

This department is thoroughly equipped with modern first-aid equipment including a physician's examining table, Beck's examining chair, eye table, metal dressing carriage, water and instrument sterilizer, combination examining lamp and magnifier, foot controlled lavatory, foot bath, hospital bed, infrared heat lamp, H. & H. inhalator and carriage, nurses' and stenographers' desks, filing cabinets, book case, and the necessary small tables and chairs to make the injured comfortable while receiving treatment. The color scheme is in light green and cream and the furniture is in walnut finish. (Figure 1)

The physical layout consists of three rooms: a waiting room where there are comfortable chairs, reading material and a bulletin board, a first-aid or treatment room, and a bedroom. In addition, toilet facilities are provided, and a work room with built-in cabinets furnishes storage for first-aid supplies. Present plans call for an additional two rooms, one of which is a much needed private office for the nurse.

Because Thilmany's mills are approximately three-quarters of a mile apart, with a growing personnel now over 1200, it was realized late in 1940,

that there was a need for greater nursing service to the lower mill employees, and a full time first-aid assistant was brought into the department. The nurse began a demonstration project at the lower mill by equipping a small office at that mill and spending an hour a day there doing dressings. The demand grew until the first-aid assistant was moved there full time with the nurse spending an hour a day with her supervising and seeing special cases. A combination clerk and first-aid assistant then was added to the upper mill staff. Out of this demonstration developed a full time graduate registered nurse for the lower mill with an adequately equipped auxiliary unit to carry on the services required of her under the supervision of the chief nurse.

In addition to the above facilities, a completely equipped first-aid cabinet is located in the paper testing station at each mill where trained first-aid men (paper testers) give emergency care when the nurses are not on duty —after 4 p. m. and until 8 a. m.

As the organizational chart indicates, the Health Department is a part of industrial relations and the nurse is responsible directly to the industrial relations director. To the writer, from practical, personal experience, with a management having a keen interest in the health and welfare of its employees, this is a workable and satisfactory arrangement. This is especially true where there is no medical director and where medical services are provided under the panel system. (Figure 2)

Standing Orders

Notwithstanding the lack of a medical director, nursing services are administered under standing written orders approved by local doctors. Any doctor on the panel is ready to give necessary advice at any time, and all are called in for conference whenever any new program is instituted. The dentists have likewise co-operated when requested to do so. Success of Thilmany's various programs has, no doubt, been possible because of this fine spirit of co-operation.

Professional Services

In Wisconsin, medical services are provided by the employer under the panel system as required by the Wisconsin Industrial Commission. There must be at least five physicians on the panel, if that number is available in the community, and the employee has free choice from this panel. Only in the case of physical examinations has the employer a voice in the selection of a physician. In the case of Thilmany, every effort is made to maintain an equitable distribution of examinations among local doctors with only one stipulation: that in the case of preplacement examination, the company selects one other than the family physician.

Physical Examinations

Since 1938, at which time the entire personnel was given medical examinations, physical examinations have been an important activity of the health department. While periodic medical examinations have not been maintained during the war due to a shortage of doctors, the nurses have done close follow-up on physical defects and arranged for selected groups to be examined. Follow-up work has been made possible through defect files and has been carried on under the direction of a local doctor. Especial attention has been given to vision, dental defects, abnormal blood pressures, and diabetes.

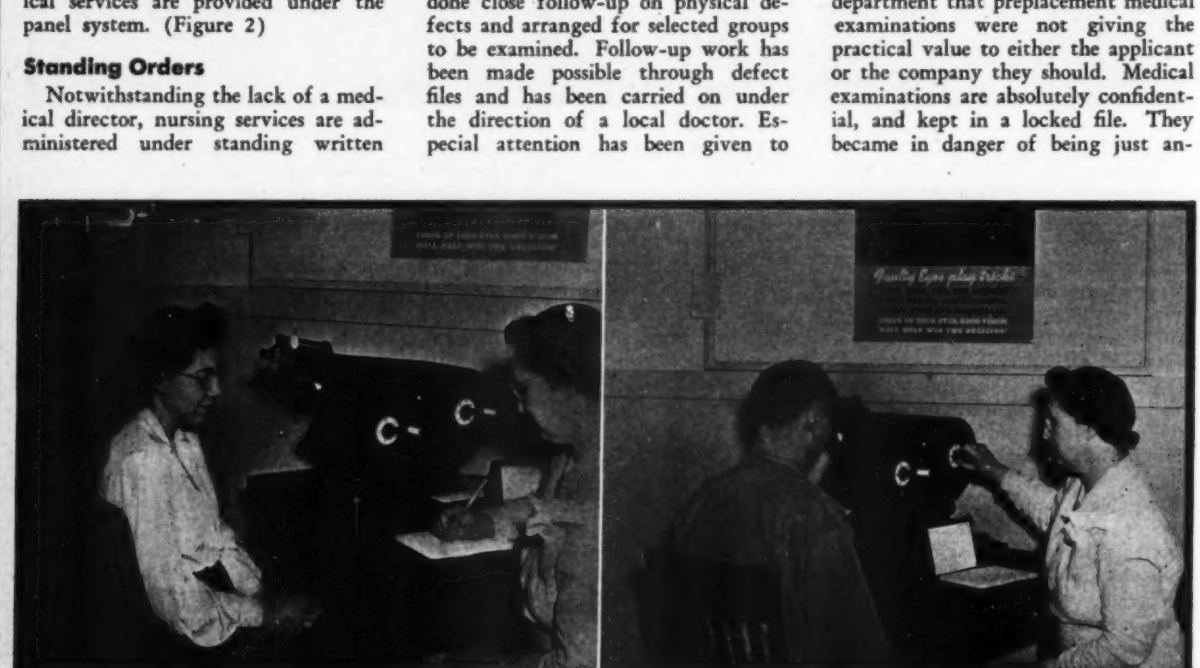
In January, 1945, the Industrial Hygiene Unit of the Wisconsin State Board of Health provided the facilities of the T. B. Mobile Unit, making chest X-rays available to all who desired. Approximately 800 employees took advantage of this opportunity.

Lacking sufficient medical facilities again this year to provide medical examinations, the nurses, under medical direction, are carrying on a health consultation service covering all employees of forty years of age and over, and who have not had a medical examination in the last year. This service covers a brief health history, T. P. R., blood pressure, weight, urinalysis and an Ortho-Rater vision test. It also gives the employee an opportunity to discuss his health and indicate any complaints he may have.

In no way is this meant to replace the medical or physical examination and should not be confused with such a program. The limitations of such a service are fully realized and are so emphasized to the employee by the nurse in her talk with him so that he will be thoroughly aware of her limitations. He is told that this service is offered as a special opportunity to come to the health department to seek any assistance he may desire. If he is referred for a medical examination, it is at the company's expense.

Preplacement Examinations

It has long been felt by the health department that preplacement medical examinations were not giving the practical value to either the applicant or the company they should. Medical examinations are absolutely confidential, and kept in a locked file. They became in danger of being just an-



Making visual tests with the B & L Ortho-Rater

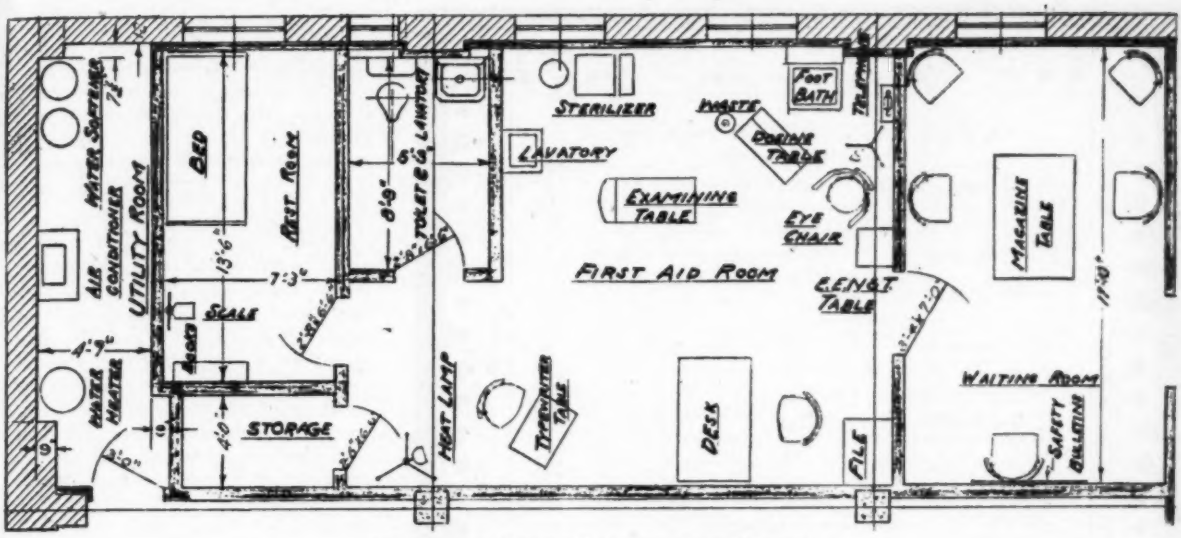


Fig. 1—Layout of first-aid department at Thilmany

other record in the file. Using the panel system made it practically impossible for the doctors to know job requirements, working conditions, hazards, etc. This was greatly emphasized with the return of our veterans, therefore, some months prior to the end of the war, a special rehabilitation committee made a study of all jobs with respect to their physical demands, with an eye to placing disabled veterans. Out of this grew the awareness of the need for physical capacities ratings in addition to the medical preplacement examination. Local physicians were called into conference and the problem explained. They have co-operated wholeheartedly, and now in addition to the medical examinations, the physician fills out a physical capacities appraisals form copied in the most part from that recommended by the USES, vision ratings have been added to the form consistent with job standards required according to the Bausch and Lomb Industrial Vision Program.

After the applicant has been interviewed in the personnel department, he is sent to the health department where a detailed work and health history is taken and the Ortho-Rater vision test is administered. He is then referred to a physician of the company's choice.

After the medical examination the applicant returns to the nurse who makes a copy of the physical capacities appraisal form which the applicant then returns to the personnel department where an attempt is made to match the applicant's physical capacities to the physical and visual demands of the job. This system has removed much of the guesswork from the proper placement of the applicant. Personnel then forwards such information as is necessary to the foreman by using a transfer card showing the employee's limitations, or lack of them. A blue card means the worker can be transferred to any job in the department to which he has been assigned without being cleared through personnel; a red card means he is restricted to the one job to which he has been assigned. All other transfers between departments or mills must be cleared through personnel. Because of this system there is, and must be, close co-operation between the medical and personnel departments.

This system has only been in operation since December 17, 1945, and thus far applied only to new employees and returned veterans, however, it is hoped that next year professional services will be sufficient to such an extent that all personnel may have the benefit of medical examinations and the above system adopted for all employees.

Dental Program

Keeping of a defect file, using 3x5 cards, led to the realization of a need for some special programs. While follow-up has been maintained on unusual blood pressures, diabetic conditions, etc., special emphasis has been laid and maintained on dental and vision programs. In 1941, a dental program was begun on a purely voluntary and educational basis. Employees showing need for dental care from their physical examination records, were interviewed and urged to seek professional services. Local

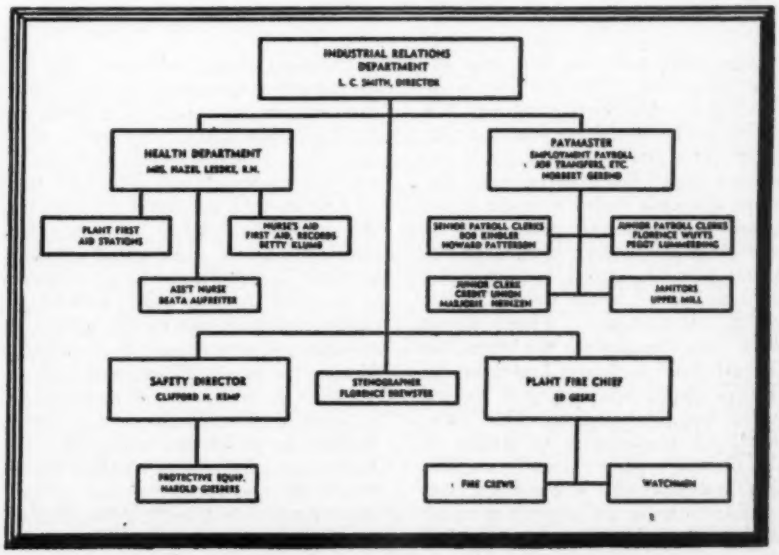


Fig. 2—Organizational chart of Industrial Relations Department

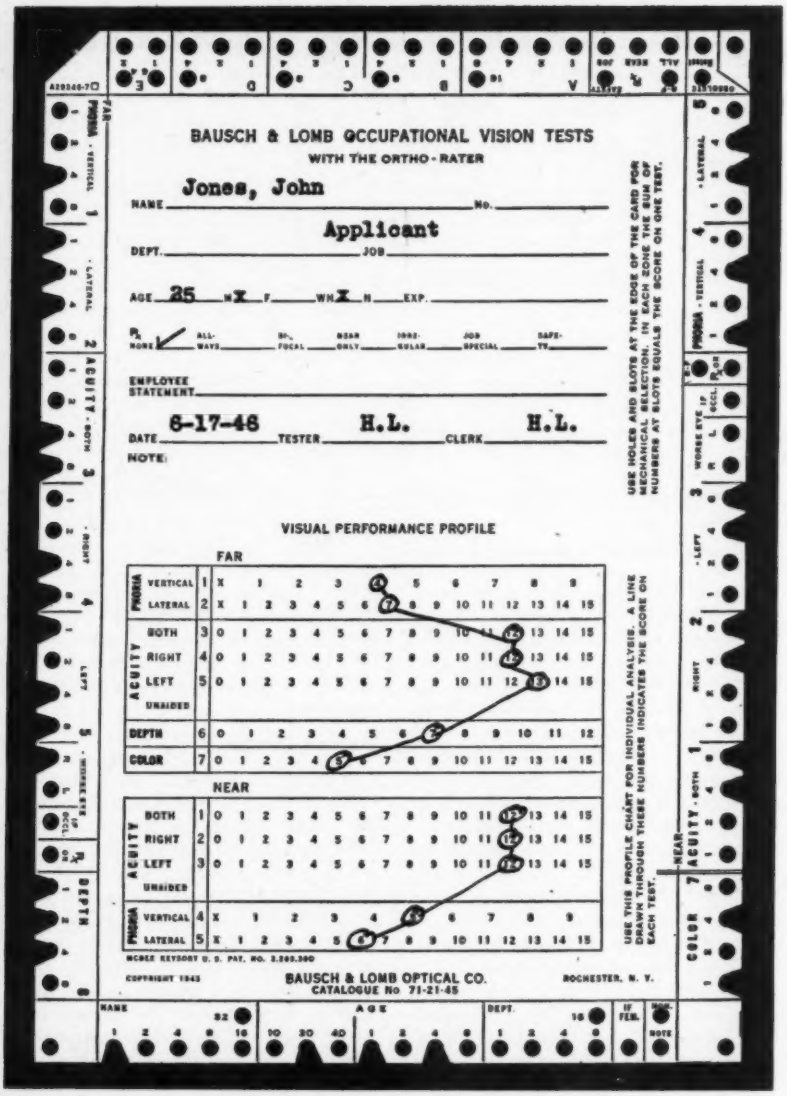


Fig. 3—Visual performance tests

dentists were called in and their advice sought on ways and means of building a stable dental program. The credit union president was also invited. As a practical inducement, the dentists agreed on a 10 per cent discount for cash and the credit union agreed to waive any restrictions on borrowing if the loan was to be for dental care. A special form was devised and issued to the worker by the health department. When dental work was completed, the form, or "dental slip," as it was known under this program, was returned to the nurse by the worker. This form permitted an accurate tabulation of the various types of dental care, the cost and discounts allowed. It was possible to make an impressive report at the end of the year. At the end of the first year of this program (1) it was found that the monetary value of the program amounted to $3,232.00 with an employee cost of $3,064.70. In little more than three years (2) under this voluntary plan, the dental program amounted to $8,570.34 actual value and to $8,085.90 cost to the employees. While it would be possible to tabulate the actual amount of dental care given, a true estimate of its value to the physical well-being of the employees, and of the reduction of absenteeism can only be surmised. No one can accurately estimate health.

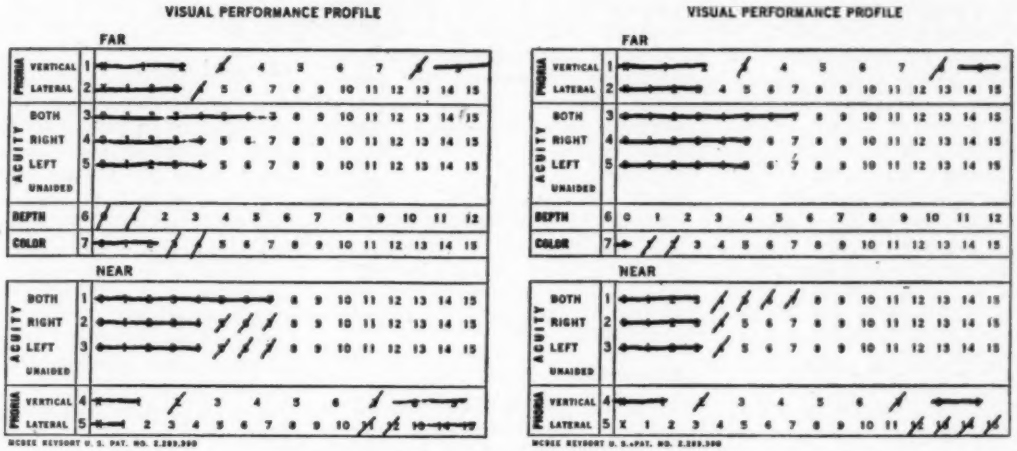
Suffice it to say this demonstration program let the Thilmany Employees Association to become sufficiently interested to offer, among its other benefits, allowances for dental and optical care. Beginning April 1, 1944, dental benefits in the amount of one-half the bill not to exceed $25.00 in benefits during the insurance year, and optical benefits in the amount of half of the bill not to exceed $15.00 during the insurance year became available to all employees who were members of the T. E. A. after six months service with the company.

In the first year under the new plan, a $6,490.26 program was carried on. Only slight changes were made in the dental slips, now known as an "Order for Dental Care," but they were made in duplicate. All orders with completed care are now mailed to the health department by the dentist, if the employee has paid his share by the tenth of the month, giving 10 per cent discount for cash. One check is issued to each dentist covering all returned orders, thereby reducing clerical work. Here again, the worker has free choice of dentists. It must be said that the dentists have shown a fine spirit of co-operation an no serious abuses of the benefits have been found.

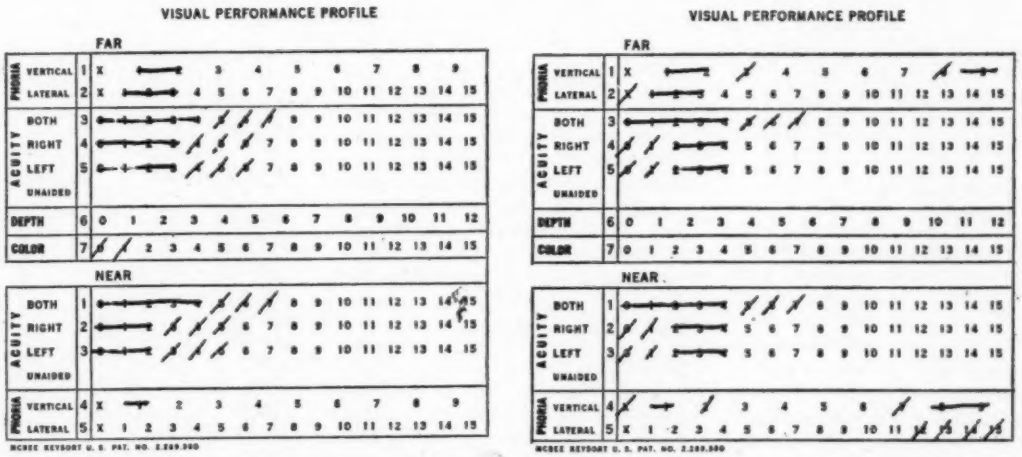
Vision Program

Soon after the inauguration of the dental program, a vision testing program was begun. A vision survey was made, using a vision testing instrument covering visual acuity, at distance, muscle balance far and near, depth perception and red and green color discrimination. This program had the benefit of advice and supervision of a well-known ophthalmologist. An arbitrary standard of 20/40 for distant acuity was set. A program toward correction in acuity to 20/40 or better was launched, without knowing if it was necessary to have an acuity of 20/40 or better to meet the demands of the job. While it was assumed that depth perception was necessary to some jobs, and that abnormal phorias might be an accident factor, no one in the plant really knew what the job demanded visually or what factors in vision related to safe operation of that job. When conditions permitted, it was decided to subscribe to the Bausch and Lomb Industrial Vision Service which seemed to be the answer to some of our vision problems. Thilmany's was the *First Paper Mill* to install the Bausch and Lomb Industrial Vision program. The writer was sent to the Industrial Vision Institute at Purdue University for training in the use of the B. & L. Ortho-Rater. After this course of training, the entire mill personnel was Ortho-Rated. (Figure 3) The Ortho-Rater covers a battery of twelve tests, near and far phorias, near and far acuity, color discrimination and depth perception. This data plus visual analysis of each job

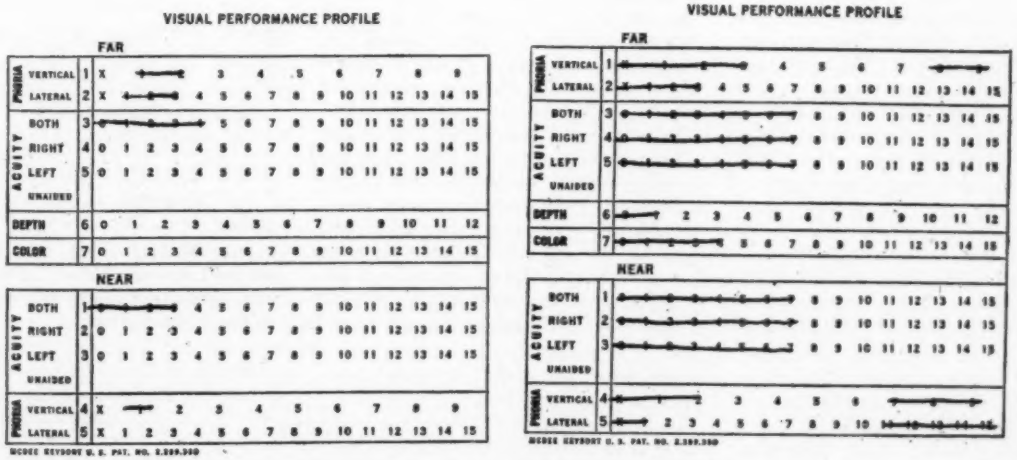
Fig. 4—Visual Requirements for Different Jobs in a Paper Mill



Requirements for Job Group A (left); Group B (right)



Requirements for Job Group C (left); Group D (right)



Requirements for Job Group E (left); Group F (right)

and performance or production ratings were sent to the Industrial Vision Institute at Purdue University for statistical analysis and it was possible to establish individual and group job standards as well as maximum and minimum vision standards (Figure 4 —unacceptable; // undesirable). It was possible, through careful, restricted placement, to employ workers who, under the arbitrary system, would have been excluded. Control of low visioned persons is maintained through the transfer cards referred to above.

It was interesting to note a positive correlation between accident experience in the paper machine department employees and those failing to meet the vision standards in the department. (3) Similar correlations were observed on production and efficiency basis in other departments.

Through optical benefits of T.E.A. a corrective program has run concurrent with the vision testing program in an effort to raise the visual level to the desired standards. Retesting of 40-year-olds and over is being carried on this year in an effort to improve or maintain this level in the age group which may be expected to begin to show visual deterioration, especially presbyopia.

Prescription Lens in Safety Glasses

Employees, wearing eye glasses, are urged to get safety glasses with prescription lens. As an enducement toward this end, the company pays half on such goggles and this applies to the newly-hired worker as well as the veteran employee. No waiting period is required of the new employee. Minor maintenance, such as bow replacements, screws, etc., of such goggles or glasses is handled by the safety department. Since August, 1941, 254 have ordered safety glasses; some of this number, however, have been changes of lens. While the costs vary slightly, the average for single lens has been between $5.00 and $6.00, and for bifocals around $10.85 —a cheap pair of glasses and a safeguard to the employee's eyes and pocketbook.

These safety glasses are of the hardened lens, safety goggle type, and not the semi-hardened dress glass type. The latter is discouraged as not meeting the demands for true safety and as giving false security to the worker.

The Health Department And the Safety Program

Monthly and annual reports furnish statistical and historical material to the safety department for use in investigations, inspections, and educational programs. All accident cases requiring medical attention are reported at once to the safety director for immediate investigation as are flagrant safety violations picked up through accident histories taken on each case reporting to the health department. There is daily conference between the nurse and the safety director in questionable or suspicious accident cases.

Absentees

All sick absentees are reported to the health department each morning by the foremen. If the absence is only one day, the worker may return to work the following day without a permit, but must report to the nurse as soon as she comes on duty to be cleared from her records. If the worker has been off more than one day, he must see the nurse for a return-to-work permit before returning to his job, and if he has been under medical care, must present written permission from his doctor before the nurse issues a return-to-work permit to the foreman.

Absentee rates are prepared monthly and included in the monthly report to management.

Records

Each employee has an individual record folder containing physical examination, accident records and a cumulative health and accident record card. From the latter card it is possible to know his total number of accidents on duty and off duty, all minor illnesses, disabling illnesses and lost-time accidents in detail. There is also a space for physical defects and home calls made to the employee. Information is transferred from a day log or sheet to these cards monthly and follow-up on health cases can be planned by the nurse from these cards.

Monthly reports covering all aspects of the nurses' activities are made to management. Minor, doctor and disabling injuries, off-duty minor and disabling accidents and minor and disabling illness are broken down by departments. A detailed historical report of all industrial injury cases referred to a doctor is made monthly for use by the safety director at safety meetings and each foreman receives a copy.

Annual Visits

Over the past five years, the number of visits to the department, annually, averages 16,302. Over the past four years, the annual average cost per visit amounts to $.466. The cost per visit was not kept prior to 1942.

Home Calls

Home calls are made two afternoons a week and at other times when emergencies demand. Due to the limited time allotted, bedside care cannot be given, but the nurse does instruct the family in simple nursing care of the injured or ill, urges medical care for the sick absentee and gains for herself a better picture of the worker, his family life and environment. The fine acceptance of the nurse, in fact the expressed disappointment if she has not visited the worker as soon as he expected, makes this portion of nursing service one of the most pleasant and gratifying activities of the department.

While this department has been called "First Aid Department" for over 25 years, it has been felt that such a title fails to convey a true picture of its activities, for first aid is only a small part of the activities. It has been the aim of the nurses to view each employee as an individual and consider all factors which go to make that individual; to see each individual in relation to his mental, emotional and physical needs; to try to understand him in relation to his home and working environment. It is felt that the title "Health Department" conveys a broader and more accurate picture of the attitude and activity of the department.

Literature References

1) "A Dental Program in Operation," *Industrial Medicine*, Aug. 1942.

2) "Progress of a Dental Program," *Ibid*, Dec. 1945

3) "Skillful Eyes Prevent Accidents," *Annual News Letter*, Industrial Nursing Section, National Safety Council, Nov. 1945.

New Law Suits

Affecting the Paper Industry

LEO T. PARKER, Attorney at Law

▶▶▶ THE HIGHER COURTS have rendered many unusual and outstanding decisions affecting the paper industry during the past few months. In fact, seldom in so short a time have so many outstanding decisions been rendered designed to assist readers to avoid damage law suits.

Since these cases are briefly reviewed, it is advisable that readers clip and save these citations for *future* reference. Also, any case can be read in detail in any good library by referring to a specific citation for identification. Not only will knowledge of these suits assist readers to avoid future litigations, but these modern citations may be used to win unavoidable law suits.

Promise by Superintendent Void

Modern higher courts consistently hold that employers are not responsible for promises or contracts made by foremen and superintendents.

For example, in West Virginia Pulp & Paper Company vs. Morton, 45 Atl. (2d) 725, reported April, 1946, it was shown that an employee of the West Virginia Pulp & Paper Company sustained injuries by inhalation of chlorine gas. A state law provides that failure of an employee to file a claim for compensation within one year after the beginning of his disability shall constitute a complete bar to any claim. This employee did not file his claim until the year had elapsed. The employer refused to pay compensation and the employee filed suit.

The employee proved that the employer's superintendent had promised him not only work as long as he was able to work, but when he was unable to work, he would be allowed compensation.

In holding the employee *not* entitled to compensation, the higher court said:

"If we recognize that Borgas (superintendent) had the authority to make the promise that appellee (employee) testified he did make to him, then corporations and business men would be at the hazard of everything that an unauthorized agent did in compensation cases."

Taft Amendment

The Taft Amendment to the Emergency Price Control Act intended to require the Price Administrator to make determination respecting each existing regulation containing specifications or standards.

For illustration, in Thomas Paper Stock Company vs. Bowles, 151 Fed. (2d) 345, reported December, 1945, the legal question was presented the court: Was the Taft Amendment applicable to wastepaper? The higher court held it negative and explained:

"Unquestionably the Administrator acted with reasonable promptness in making his determination as to MPR 30 in less than two months after the Taft Amendment became law. We think that the Taft Amendment required no more of him than this."

Only Court Can Decide

According to a late higher court decision disagreements between officials of Office of Price Administration, holding original regulations discriminatory, are *not* evidence of unfair discrimination.

For instance, in Consolidated Water Power & Paper Company vs. Bowles, 150 Fed. (2d) 960, reported October, 1945, the Consolidated Water Power & Paper Company sued Chester Bowles challenging the Administrator's interpretation of a regulation relating to paper and attacking the validity of the regulation.

Previously the lower court had held that Maximum Price Regulation No. 451, which established ceiling prices to govern sales of book paper, brought about an unfair and improper discrimination between the company's products and certain other book papers and this court ordered the Regulation set aside insofar as it denied the same grade classification and form of price control to products *recognized* in the book paper trade as being of equal quality. Following this decision the Administrator issued Amendment 5 to the Regulation.

This court held that only a court can decide whether the new price regulation contained same type of discrimination as the prior regulations.

Also, this court held that an employee of the Office of Price Administration will not be permitted to give his opinion before a court that a new regulation contains the same type of discrimination as a prior regulation.

This case was again taken to the court in Consolidated Water Power & Paper Company vs. Bowles, 152 Fed. (2) 661. This higher court said:

"We adhere to the view expressed in our earlier opinion that complainant (Consolidated Water Power & Paper Company) has not shown itself to be entitled to higher prices for its products. Further we find no impropriety in the Administrator's purpose to establish model prices in a complex industry. However, we find the price structure of Maximum Price Regulation No. 451 and Revised Maximum Price Regulation No. 451 is defective under our previous judgment in that the prices were fixed on the basis of quality and yet all products of equal quality were not given the same price. If quality is to bear upon the prices of the products of complainant's competitors, it should also bear upon the prices of complainant's papers. Conversely, if quality is eliminated as a pricing factor for complainant's products, it should also be eliminated as a factor in the pricing of competing products."

Local Union

In Bacon vs. Paradise, 63 N. E. (2d) 571, reported January, 1946, it was shown that employees of Brightwater Paper Company had an independent or local union. The regular officers of this local union abandoned their offices and went over to a national organization or union. The members who desired to continue with the local union were obliged to choose temporary officers.

The higher court held that the regular officers ceased to be members of the local union, and the temporary officers could sue to determine who was entitled to assets of the local union.

OPA Ruling Upheld

Under the present law, the Price Administrator is authorized to employ reasonable standards in connection with price control, when he determines that no practical alternative exists for securing effective price control with respect to a specific commodity.

For instance, in Thomas Paper Stock Company vs. Bowles, 148 Fed. Rep.

(2d) 831, reported June, 1945, it was shown that Section 1347.14(d) reads:

"The maximum prices for sales of unsorted wastepaper to any person shall not exceed the maximum price prescribed by this regulation for 'No. 1 mixed paper,' regardless of the grades and quantity of each grade contained in such unsorted wastepaper."

The Thomas Paper Stock Company filed a complaint based upon the contention that the section contradicts Subsection (j) of Section 2 of the Emergency Price Control Act of 1942, known as the Taft amendment, which was enacted on July 16, 1943.

The higher court refused to agree with this contention, saying:

"It must be concluded that the Taft amendment did not invalidate Section 1347.14(d) merely because the specification or standard employed by that section had not previously been used by the wastepaper industry or required by another Government agency."

On the other hand, see Flett vs. Bowles, 142 Fed. Rep. (2d) 559, reported August. In this decision the higher court clearly held that the Price Administrator had power to *reasonably* extend price control to the wastepaper industry, since he had reason to anticipate that unless subjected to price control the wastepaper prices would rise to an extent inconsistent with purposes of Emergency Price Control Act. This higher court held the provision arbitrary and discriminatory which authorized paper mills to pay brokerage, in addition to the established maximum prices, to brokers in wastepaper who took title and warranted the merchantability of wastepaper. An exclusive selling agent for large industrial accumulators of wastepaper, objected to the provision on the contention that it enabled brokers to offer industrial accumulators the full ceiling prices, whereas industrial accumulators selling through an agency could receive only the ceiling price minus a commission. The higher court agreed with this contention and held the provision *invalid*.

Total Temporary Disability

Modern courts are growing adverse to granting compensation based upon permanent total disability, where the testimony of permanent injury is not *positive*.

For illustration, in Valentine vs. Southern Paper Company, 20 So. (2d) 814, reported March, 1945, the testimony proved that while assisting in loading pulpwood an employee slipped and strained his back. Compensation was paid under the State Workmen's Compensation Act by the employer for several months when payment was discontinued.

The employee sued for compensation based upon total and *permanent* disability. However, the testimony of different examining physicians was somewhat conflicting as to the exact extent of the injury. Therefore, the higher court allowed total disability for one year because at the end of the period the employee can reopen the case if his condition justifies further legal controversy. In other words, the court allowed temporary total disability compensation.

Rule of Perpetuities

The "rule against perpetuities" prohibits creation of *future* interests or estates which may not become vested within a life or lives of persons now living. This general and universal law was adopted after an experience in England many years ago whereby a man left a will to pay $1,000 on interest for 1,000 years. The total amount accumulated over this period was found to be more than all moneys obtainable by largest banks in England. Therefore, it was decided to prohibit wills, contracts and other instruments in or near "perpetuity." However, this rule does not prohibit common protective corporation stock transfer agreements.

For illustration, in Everett Bank vs. Pacific Waxed Paper Company, 157 Pac. (2d) 707, reported June, 1945, it was shown that the owner (named Engle) of stock in a paper corporation made an option agreement whereby he promised that if at any time during the next 25 years he desired to sell his stock he would give a named person the first opportunity, for 15 days, to purchase it at such price and upon such terms and conditions as Engle had been offered.

In subsequent litigation it was contended that this agreement violated the rule against perpetuities. However, the higher court refused to agree with this contention, saying:

"The rule against perpetuities . . . applies only to the vesting of future estates and does not apply to vested estates. The option agreement did not create a future estate or interest to become vested at some future time."

Trust Indenture Not Liable

Considerable discussion has arisen from time to time over the legal question: When is a trust indenture nontaxable under state laws as a mortgage substitute?

For illustration, in Defiance Paper Company vs. Rollin Brown, 60 N. E. (2d) 840, reported June, 1945, it was disclosed that the Defiance Paper Company executed a trust indenture to a bank (trustee) mortgaging real estate and personal property to secure an issue of bonds in the amount of $500,000. The trust indenture was recorded, and the recording tax paid thereon.

On December 1, 1939, of these bonds there was unpaid and outstanding $238,800, which were on that date called in and new bonds issued in exchange therefor to their holders. On the same date the present trust indenture was executed by the Defiance Paper Company to the Power City Trust Company as trustee to secure payment of the $238,800, and by such instrument certain additional personal property was pledged in pursuance of a request made in accordance with the terms of the 1927 trust indenture.

The new indenture was recorded without payment of a recording tax under claim of the paper company that it was an additional mortgage and exempt from the recording tax. The New York State Tax Commission held that the new indenture was taxable.

The higher court reversed the decision of the Tax Commission and held the trust indenture nontaxable.

Personal Property Law

All states have enacted laws known as "Personal Property Law," or "Bulk Sales Act." These laws require purchasers of "businesses" to register with named state officials, and generally advertise, the intended sale or purchase in order to give creditors of the buyer or seller ample time to present their claims or liens.

For example, in Davignon vs. Racquette River Paper Company, 64 N. E. (2d) 279, reported December, 1945, it was shown that a man named Sisson was engaged in the business of buying and selling pulpwood in and about a wide area of northern New York State. When heavily indebted to a man named Davignon he sold his business in bulk to the Racquette River Paper Company without complying with the provisions of Personal Property Law.

Davignon filed suit against the Racquette River Paper Company.

This higher court refused to dismiss the suit against Racquette River Paper Company although counsel for the latter argued that Davignon had no legal right to object to its purchasing Davignon's business.

Red Cross Trade-Mark

According to a late higher court decision any company that has used

"Red Cross" as a trade-mark prior to 1905 may continue its use.

For illustration, in A. P. W. Paper Company, Inc. vs. Federal Trade Commission, 149 Fed (2d) 424, it was shown that a paper company had used the words "Red Cross" and the red cross emblem to designate certain of its products, as toilet tissues and paper towels. The company has used the trade-mark since 1897, but did not register the trade-mark in the United States Patent Office until 1911.

The Federal Trade Commission ordered the company to cease and desist from using the words "Red Cross." This order was based on the fact that the emblem of the Greek red cross has long been associated in the minds of the public with the American National Red Cross and that the use of the words "Red Cross" on paper merchandise and products has a tendency to mislead and deceive a substantial portion of the purchasing public into the mistaken belief that the company's goods are sponsored or approved by, or in some manner connected with, the American Red Cross organization.

However, the higher court reversed this decision and held that the company could legally continue using its trade-mark because it had started using it before 1905. However, no company or seller may legally use Red Cross as a trade-mark on any kind of products unless it was used prior to January 5, 1905.

No Fraud

According to a late higher court decision all parties to a deed must read and understand its terms. Neither the buyer or seller may subsequently have the deed reformed *except* in case of fraud.

For instance, in Hill vs. Agnew, 34 S. E. (2d) 702, it was shown that a man named Hill sued a company to prevent the latter from cutting timber on land purchased from Hill. During the trial testimony was given that it was verbally agreed that the deed should contain a clause that the seller retained timber rights. The seller contended that the company could not legally cut the timber because "by accident, mistake, and omission there was no reservation made of the timber" in the deed.

The higher court refused to prevent the company from cutting the timber, saying:

"The general rule is that there can be no reformation of a written contract except where there is a mutual mistake, or a mistake on the part of one contracting party and fraud on the part of the other."

Purchaser Wanted to Rescind

It is not uncommon for bona fide disputes to arise between buyers and sellers as to their rights under contract for sale of land having pulpwood timber thereon. But it is certain that a purchaser who takes possession of land cannot rescind the contract without unusually good reason.

For instance, in Lang vs. Horne, 23 So. (2d) 848, reported January, 1946, it was shown that a buyer and owner of land entered into a contract for purchase of the land, it being understood that the purchaser intended to cut pulpwood from said land. The seller promised to supply abstracts of the title. However, he did not do so. The purchaser without demanding the abstracts continued in possession, use, and enjoyment of the land and cut pulpwood therefrom. Later a dispute arose about the purchaser's right to cut the pulpwood timber from land. The higher court was asked to decide whether the purchaser had a right to cancel or rescind the contract. This court held that the purchaser had no legal right to rescind the contract for the seller's failure to deliver the abstracts within the time required by the contract, whether such failure was willful or not.

In other words, this court clearly held that before taking possession of purchased property the purchaser should demand the seller to fully comply with the terms of the contract. If the purchaser takes possession and later attempts to cancel or rescind the contract, he will not be awarded a favorable verdict.

Adverse Possession

Modern higher courts consistently hold that any person or company which uses land against the desires of the real owner may *after* approximately 20 years claim legal ownership to the land. This is known as adverse. However, to constitute adverse possession it must be open, notorious, exclusive, hostile, continuous, and unbroken for the whole period. Moreover, payment of taxes on real property does not establish or prove ownership.

For illustration, in West Virginia Pulp & Paper Company vs. Cone, 153 Fed. (2d) 576, reported April, 1946, it was shown that a man named Cone sued the West Virginia Pulp & Paper Company claiming $25,000 damages for trespasses by the company in entering his land and cutting and removing timber therefrom. During the trial Cone contended that he owned the land because he had camped and lived on it a few months every year for several years. Also, he paid taxes to the state on the land.

Although the lower court allowed Cone $25,000 damages, the higher court reversed the verdict, saying:

"It seems obvious that the plaintiff (Cone) here has failed to establish such possession, actual or constructive, as to establish his title to the property . . . The payment of taxes is not evidence of title as is supposed in popular myth, but the failure to pay is evidence that no claim was made."

Imported Goods Nontaxable

It is well known that a state cannot legally tax imported merchandise stored in a warehouse in original packages. Recently, however, the Supreme Court of the United States enlarged this usual law by holding that "imports" are goods received from *anywhere* outside the United States.

For illustration, in Hoonen, 89 Supreme Court Law, ed, 852, it was shown that a manufacturer employed a broker to purchase fiber in the Philippine Islands. The manufacturer's purchase price included the cost of the goods at the point of origin, freight, insurance, customs clearance and duties, broker's commission, and other incidental expenses. Moreover, this merchandise was consigned to the broker with directions to notify the manufacturer.

The Supreme Court held this manufacturer is an "importer" and that a state has no legal right to tax the goods which were placed in a warehouse for storage.

Paper Warehouse Burns

It is well established law that any contract exempting a person, as a landlord, from liability for consequences of his negligence is void and against public policy.

For illustration, in Nashua Gummed and Coated Paper Company vs. Noyes Buick Company, 41 Atl. (2d) 920, reported June, the testimony showed that a paper company leased a warehouse building under a contract which contained a clause that the paper company would pay all charges for electric current used in the warehouse and "render the lessor harmless from any claims for loss or damage from fire, theft, or leakage to merchandise, equipment, fixtures, machinery, or property of the lessee during the entire period of occupancy by the lessee."

The landlord made a contract with a contractor to perform repairs on the warehouse building. This contractor while using an acetylene torch permitted sparks to drop on combusti-

(Turn to page 662)

Employee Education *in the Paper Industry*

WALTER G. HENDRICH
Hammermill Paper Company

▶▶▶ AN APPRENTICESHIP of from two to five years was required in the early days of the industry. After that period of time, the papermaker became a helper and finally, after ten years, he could claim a master papermaker's rating.

The paper industry started from a craft. In its earliest stages the workers in a mill were members of one or, at the most, a few families. Within the last century, however, the mill has expanded—in many instances the family has become hundreds or thousands of employees.

In those days, tools or equipment were simple, consisting principally of molds, felts, presses, and simple stock preparation equipment. Production was small, and the apprentice could comprehend easily the desired amount and quality of raw materials. But it was only after many years that a master papermaker acquired the skill to create a fine product—one which he might offer with great pride. Master craftsmen of those days were found in mills small enough to enable an individual to learn the purchasing of materials and equipment, as well as the production and sale of the product.

With the advent of the papermaking machine, the picture changed considerably. Progress in education has produced engineers, physicists, and chemists, who in turn have created complex machinery to replace the simple tools. Instrumentation to control some of this machinery has progressed far beyond the comprehension of the early papermaker.

In the early days, the manufacturing process was visible to the apprentice and helper in all its stages. Today paper is made through the use of scientifically calculated formulas, with instrument control and laboratory process tests. Instead of the craftsman handling the product from its pulp stage to finished paper storage, the process is broken down into many specialized jobs—each only one phase of papermaking—and often the worker has become merely the tender of a machine or executor of the partial process in his immediate environment.

Skill in tending such machines is learned in a relatively short time, since it involves only a small part of the entire papermaking process. The paper mill worker, therefore, may not see the total picture because of losing himself in his specific job. He no longer may be aware that he is making a definite contribution to the making of a product. Instead, he may feel he is a necessary evil to the employer—making the best of it because he must have an income.

The production of paper per employee per year has increased to a tonnage unthought of a century ago. The cost structure behind the product has become so complex that only specially trained personnel can cope with the necessary function of cost accounting and guide a mill organization successfully through economic rise and fall.

Universities have supplied the industry with foremen, superintendents, chemists, physicists, engineers, economists, cost accountants, statisticians, and administrators.

Little systematic work, however, has been done by the public school system or paper mill management in the training of workers for particular needs. The public school system, on the other hand, recognizes and includes in its curricula subjects which spring from the desires, wants and increased needs of each individual in our country of abundance—desires and fulfillments which the individual hopes to obtain upon the day he starts to work in industry.

It must be a baffling and disturbing experience, therefore, for the young man entering employment in a paper mill. The newcomer is assigned to a job under the supervision of an older employee who supposedly introduces him to his new field of activity—the foundation for his future enjoyment of living and earning capacity.

The old employee in most cases had to pick up the secrets, short cuts, and hard-to-do's the hardway—by his own searching. He gives the newcomer a rather diluted, often a wrong personal interpretation of the work expected in his mill job. The results are obvious. The new employee learns his first negative lesson: "I am here to make some money. I will be glad when I get a job that earns more money and I can handle one of those machines as a tender." With this thought in mind, he will never appreciate the value and importance of the apprentice job.

Instead of applying himself to a study of his job, instead of having the desire to learn more about the activity which will support him and his family, he may prefer to bluff his way around or over his immediate boss or foreman. Success on this basis is very small, and more and more young people, with no experience or skill, become floating workers on the vehicle of dollars per week.

The great need for a general appreciation by most paper mill employees of the knowledge and effort required in papermaking, and of the phase or step the individual contributes, scarcely can be denied by management or worker.

Noble attempts at training have been made by some companies in the industry, but most of these efforts have stopped with foreman training or study groups, reviewing their knowledge or exchanging ideas.

An educational system or approach to serve the newcomer in the industry and the unskilled or semi-skilled employee is hereby proposed. Purposely, the plan includes no quantitative data or specifications on the end product. In order to familiarize the novice in the paper mill with his contribution to the product or share of responsibility, it is suggested that a quality description of paper be used as the center of presentation. (See accompanying chart). Such a presentation makes a good introduction to the terminology or words used in the industry, some words the worker has never heard in his school experience.

Most pulp or paper mills have a laboratory performing many kinds of tests on raw materials, processes, products, and operations. The chart emphasizes the fact that the chemist's work is one of service; he is neither a policeman nor a manager. His aim is to serve in the making of a better product.

Instruments, whether controlling, recording, or indicating should not be a mystery to the newcomer. Neither should they be a field of adventure for him to learn how they work or how they are put together. A new worker should be impressed with the fact that instrumentation is helpful, that it saves labor in testing and increases the productivity in tonnage or the return in dollars and cents, and that it insures less troublesome operation.

Great stress can be laid upon group activity. If the worker knows that he shares the responsibility with his co-workers during the twenty-four hours of operation, he will approach his job with much more understanding and become more co-operative.

In order to give him a good concept of what is being done in his department, it may be advisable to acquaint

MANUFACTURING PROCESS — PAPER QUALITY

Equipment	Material: Conversion	Material: Basic	Appearance: Color	Brightness	Cleanliness	Gloss	Smoothness	Formation	Watermark	Graininess	Opacity	Durability: Substance	Thickness	Mullen	Tensile	Folding	Density	Stiffness	Smoothness	Tear	Permanence: Rosin	Ash	pH Value	Alpha Cell.	Cu Number	Aging	Workability: Erasure	Surface Sized	Writeability	Printability	Porosity	Moisture	Cleanliness	Process Tests	Instrument	Personnel	Tonnage	Effect on Cost
1. PULPING	**Here List:**											Indicate which quality is effected in the various processes and by the various materials.																					List all tests made in various phases in line with specific process	List if indicating recording control in line with process	Shifts Male Female	Per hour or per day	Point out waste of material
List all equipment from Barker to Wet Machine	Steam Water Chlorine, etc.	Wood Pulp																																			
2. PAPERMAKING																																					
List all equipment Beater to P.M. reel	Alum Rosin, etc.	Sulphite Sulphate Soda, etc.																																			
PAPER MACHINE WET END (Detail Example)																																					
Fan Pump																																					
Stuff Pump																																					
	White Water Fresh Water		X X X X X X		X X			X X	X X		X X										X X X X												X X					
Mixing Box												X																					X					
Sand Trap					X																												X					
Vortrap					X																												X					
Screen																																					
		.3%-1.0% Paper Stock																																			
Head Box								X																													
Inlet								X																													
Wire												X	X																								
Speed												X	X			X				X																	
Shakes								X								X				X																	
Stroke								X								X				X																	
Suction Boxes								X	X																												
	White Water Recovery To Mixing Box To Beaters				X X																		X X										X X				
Dandy								X	X	X										X																	
Suction Couch								X																													
	Paper Trim & Shower Water																																				
		18% Dry Waterleaf																																			
DRAW																																					
1st Press & 1st Wet Felt	Press Water									X X					X	X				X										X	X					
DRAW																																					
2nd Press & 2nd Wet Felt										X X					X	X				X										X	X					
		35%-40% Dry Waterleaf																																			
3. FINISHING																																					
List all equipment		Calendered Trimmed Paper, etc.																																			
Super calender—cutter																																					
Trimmer, etc.																																					
4. CONVERTING																																					
List all converting equipment	Coating Clays Resins, etc.	Paper																																			
Services																																					
Water Purification																																					
Power Plant																																					
Maintenance																																					
Engineering																																					
Laboratories																																					
Control																																					
Research																																					
			Testing									These									Qualities																	
Purchasing																																					
Cost Department																																					
Advertising																																					
Sales																																					

him with the tonnage produced per hour, day or year. After some experience, he will have a better concept of lower or higher production—due either to failure on his part to do his job or to a special effort to do his job well. Great emphasis, however, should be given to the quality of the product which should not suffer under increased tonnage.

Effect on cost due to waste of material, or due to greater yield can well be emphasized in such a presentation. Such emphasis brings about greater respect for equipment and materials with which the worker is entrusted during his working hours.

The use of proper terms in departmental operations (whether a half-product, a by-product, or waste) will clarify to the novice the field of his labor.

It is further advisable to show the newcomer how various service departments are related to the end product, equipment, materials, and personnel. Under such services may be listed: water purification, power plant, mill control, research laboratory, engineering, maintenance, yard, fire protection, police protection, purchasing department, cost, and sales departments.

A detailed flow chart for each department or manufacturing phase (Note Paper Machine Wet End in accompanying chart) is recommended for use in familiarizing the new worker with all detailed activity in his environment. The chart should use local paper mill language for the equipment and for the materials, and should explain the process.

The responsibility of training workers for the paper industry really has to be taken by mill management due to absence of trade or industrial schools in most paper or pulp producing areas. In order to use this simplified flow chart system in educational work among mill employees successfully, the following three steps are essential:

1) Management must agree that an over-all knowledge of employees' work and the product thereof is beneficial to the end product, pulp or paper, and must place responsibility for successful operation in its rightful place.

2) Each divisional superintendent and supervisor must know the operations in his department and must have a clear concept of each individual job. These leaders should have a better understanding of the work expected of their employees to bring about a better product and to make supervision easier. With the help of individual job analyses, they can familiarize themselves in two one-hour meetings with the pertinent information presented in the educational charts. After a thorough understanding of the system, this educational material is ready for presentation to the new workers.

3) After management and supervision are clear on the subject and understand the value of the charts as daily reminders to the workers in the mill, a master chart explaining the working of the entire paper pulp mill should be posted in each department along with a particular detail chart of the specific department in which the master chart is posted. Two or three one-hour meetings over a period of two or three weeks should be held by the instructor, supervisor and group of workers doing one particular job. In these meetings, a general picture of the whole organization should be presented to the workers, followed by a thorough explanation of the workers' particular activity and the effect of such work well done on the product.

In order not to have the educational program interfere with production, it may be necessary to hold meetings at the end or at the beginning of a shift. Any company fortunate enough to have individual detailed job analyses on record could present the specific analysis of the individual job to the workers doing that job after such meetings. The educational system should not involve pay rates, general management affairs, labor relations or union affairs. The purpose of the system is only a better understanding of the job of the individual worker and the over-all results of all work, namely, the final product—pulp or paper.

New Law Suits Affecting the Paper Industry

(Continued from Page 659)

ble materials starting a fire which destroyed the warehouse and the contents comprising wax, glue, tapioca flour, chromic acid, and paper, and valued at $75,000.

The question presented the court was whether the above clause in the lease contract relieved the landlord from $75,000 liability. In holding in the negative, the higher court said:

"The ordinary contract exempting a person from liability for the consequences of his negligence is held to be void, as against public policy."

Sales Tax Law

Considerable discussion has arisen from time to time over the legal question: When a manufacturer purchases different and various materials used to manufacture its products, must the manufacturer pay the state's sales tax?

In Mounting & Finishing Company, Inc. vs. McGoldrick, 60 N. E. (2d) 825, reported July, 1945, it was shown that a company was engaged in the business of manufacturing products sold to various customers. The company purchased various materials as cardboard, paper, glue, wood, fiberboard, etc., and used them to build up, manufacture and assemble the completed product sold to its customers.

The company contended that it should not be compelled to pay the sales tax on these various materials which it purchased and used in manufacturing its product.

The higher court refused to agree with these contentions and in holding that the company must pay the sales tax, said:

"Petitioner (company) was not buying the paper, fiberboard, etc., 'for resale'."

Court of Customs

Very frequently the Court of Customs and Patent Appeals reverses decision of Patent Office Examiners of patentability of inventions.

For illustration, in Heritage, 153 Fed. (2d) 115, reported February, 1946, it was shown that an inventor filed an application for a patent on method of making a coated rigid porous structural fiber board which comprises coating a mat of fibers with a compositoin having sufficient pigment to hide the surface fibers, and having an aqueous vehicle in which is dispersed a heat-reactive binding material capable of binding the pigment to the fiber and to itself.

The Patent Office Examiners refused to allow the patent because of prior anticipating patents. However, the Court of Customs and Patent Appeals granted the patent.

Early Papermaking in New York State

Replica of the Onderdonk Paper Mill visited by George Washington (from watercolor by Ernest Cramer)

HARRISON ELLIOTT

▶▶▶ PAPERMAKING in New York State began in 1768. The first mill to operate was that of one John Keating, located on what was then known as York Island, now the Borough of Manhattan. Keating's earliest advertisement was an urgent appeal for new linen rags. It appeared in the *New York Journal*, John Holt, publisher, February 18, 1768. It read:

Ready Money for clean Rags, may be had of John Keating, between Burling's Slip and the Fly-Market in Queen Street.

All those that really have the Welfare of their Country at Heart, are desired to consider seriously the importance of a Paper Manufactory to this Government, and how much Good they may do it by so small a Matter, as saving only the Linen Rags, especially the fine ones, that would be otherwise useless. This saving is recommended not so much for the value of the Money that one may immediately receive from the Rags, which can be but a Trifle at first, as for the Benefit the Public will receive, if the Manufactory is properly encouraged, so as to supply us without importing Paper from Abroad, for which—besides the Money for the first Cost, the Province must be further drain'd to pay a most arbitrary and oppressive Duty thereon, which when the Money is once paid, is entirely lost to us, and returns no more forever. But if paid for Work done among Ourselves, it is in a State of continual Circulation, and it will pass thro' our own Hands again and again; and the Duty at least, is a clear Saving in Cost.

The Saving of Rags requires very little Time or Trouble, nothing more is necessary than a Habit of Care and Attention to preserve instead of throwing them away, when they have become otherwise useless. A Paper or Linen Bag for that Purpose should be hung up in some certain Place in every House, and a little Care and Patience would soon, almost insensibly, produce a Habit of Saving, that would have the desired Effect, and supply us with Paper at Home sufficient for our own Use, without Money, whereas now we are obliged to send Money abroad, not only to pay for the Paper at a high price, but an oppressive Duty also.

Here was an appeal to patriotism, for economic independence and an attempt to instill a habit of saving. All this was an effort to support a struggling home industry when much of its commodity was imported from England and heavily taxed by that country.

That the Keating mill was completed is evidenced by an advertisement in the *New York Journal* under date of September 22, 1768, with the wording as follows:

Facsimile of the earliest watermark of the Onderdonk Mill as it appears in a book printed by Hugh Gaine in 1774

N. B.—As the Paper Mill is now completed, those who have Rags by them, are requested to bring them in, and all Persons who wants (sic) to be supplied with Paper of this Manufacture, are desired to send their Orders to John Keating, which shall be completed as fast as possible.

On June 1, 1769, a labor shortage brought forth this printed plea for help in the mill:

Journeymen Paper Makers may meet with good Encouragement, by applying to John Keating.

Keating's advertisements appeared at intervals until January 25, 1770. There seems to be no record of the passing of the mill at a time, too, when its product was most needed and when the mill had a monopoly within the Province.

A somewhat interesting evidence of a paper shortage prior to the making of paper in the Province is given by an advertisement in Hugh Gaine's *New York Mercury* dated January 14, 1765, reading as follows:

We hope our Customers will excuse the Smallness of our Paper, this, and the last Week; it being out of no Disregard to them, nor Indulgence in the Printer; but occasioned by an unforeseen Accident, and the inclemency of the Weather, which has prevented our receiving the usual Supply of large Paper from a neighboring Province.—Hugh Gaine.

Of this Hugh Gaine, more anon. These earnest pleadings, for rags were in the interest of self-preservation, and the lack of wherewith to

print was a matter of grave concern in preserving the commercial life of the Colonies.

After the repeal of the Stamp Act in 1766, heavy duties were laid upon tea, glass, paper, etc. Paper was a commodity of more importance than tea, and was of great service to the colonists in expressing their grievances. But the dramatic gesture was made with tea by the Boston Tea Party and paper was spared from use in this somewhat wasteful demonstration.

Restrictions were placed on the manufacture of paper and the Colonies were dependent upon England for much of it. That was the chief reason Benjamin Franklin was so active in helping the organizing of eighteen paper mills in this country.

In 1773, there was completed at Roslyn, Long Island, New York, what became known as the Onderdonk Paper Mill. It was a venture undertaken by Hendrick Onderdonk, Hugh Gaine, printer and seller of books and general merchandise, and a Henry Remsen. An unfortunate slip in Week's *History of Paper Manufacturing in the United States* has the date of origin of the Onderdonk mill as 1733. This has led some to believe that it was the first paper mill erected in New York State. The Onderdonk mill began operations with this announcement in Hugh Gaine's newspaper the *New York Mercury* under date of October 11, 1773:

The printer of this paper, in conjunction with two of his friends (Hendrick Onderdonk and Henry Remsen), having lately erected a Paper Mill at Hempstead Harbour on Long Island at a very great expense, the existence of which entirely depends on a supply of Rags which at present are very much wanted; he therefore most humbly entreats the assistance of the good People of this Province, and City in particular to assist him in the undertaking, which if attended with Success, will be a Saving of some hundreds per annum to the Colony, which has been constantly sent out of it for Paper of all sorts, the manufacturing of which has but very lately originated here; but should the public countenance the same it is more than probable that branch will be brought to considerable perfection in this place. The highest price will therefore be given for all sorts of Linen Rags by the Public's Humble Servant, HUGH GAINE.

Hendrick Onderdonk came to Roslyn in 1758 and bought a grist mill there. He was very much occupied with the running of the grist mill and a high-class general store, but later conceived the idea of operating a paper mill which he and his two associates started in 1773, as previously mentioned.

What brought the paper mill much in the way of fame was Washington's visit there on April 24, 1790, of which Washington made a note in his diary. The entry reads in part: "This gentleman (Hendrick Onderdonk) works a Grist Mill and two Paper Mills, the last of which he seems to carry on with spirit and profit."

Reproduction of George Washington's watermark

The Onderdonk Mill was in continuous operation until 1891. *Lockwood's Paper Mill Directory* of that date lists the proprietor as Myers Valentine and the equipment consisting of two 350-pound beaters, one 48-inch cylinder machine, water and steam power, and producing 4,000 pounds of strawboard and wrapping in 24 hours. In the early days, the mill made fine printing paper of linen rags, and books printed by Hugh Gaine on this paper as early as 1774 are still in existence.

In 1765, Hugh Gaine's advertisements in his *New York Mercury* indicate that paper played no small part in his merchandising. He advertised in the following manner:

To be sold by Hugh Gaine the best English Parchment, Imperial, Royal, Medium, Demy, Post, Propatria, and Quarto Post, Gilt and Plain Paper. (There followed a list of various items for sale and ended with the statement:) And many other articles too tedious to mention.

Hugh Gaine held forth as printer, bookseller, and stationer at the Bible and the Crown, in Hanover Square. He advertised that he did "all sorts of Printing Work with Care and Expedition."

Some idea of what was paid for linen rags is given in an advertisement in the *New York Gazette* dated December 16, 1774, wherein it is declared that

Three Pence per Pound will be given by Hugh Gaine for the best Sort of good, dry, clean Linen Rags, and so in Proportion for those of inferior Quality.

A mention of Hugh Gaine as a purveyor of quack remedies and cosmetics at a time long before pure food and drug laws were known, may be of interest. He sold nostrums with such beguiling and intriguing brand names as The Princely Beautifying Lotion, Turlington's Balsam of Life, Dr. Ryan's Incomparable Worm-destroying Sugar Plums, White Drops for Scurvy, Sweating Powder, Essence of Balm of Gilead, A Golden Tincture for Hysterical Diseases, Lady Molyneux's Italian Paste, The Venetian Paste for Enamelling the Hands, Neck and Face, "and other articles too tedious to mention."

Hugh Gaine was a very enterprising sort. He was of Scotch-Irish stock. He came to New York in 1745, and secured employment from James Parker, whom Benjamin Franklin had established as a printer in that city in 1742. His term of service there lasted until 1752. He died April 27, 1807, and was buried in a vault in Trinity Church graveyard.

96,000 ACCIDENTAL DEATHS DURING 1945

Prepublication data in the *National Safety News* headlines this figure from "Accident Facts—1946 Edition," the National Safety Council's annual compilation of information about accidents.

The data shows the occupational death toll remained unchanged in 1945 as compared with 1944—16,000 in each year, or a rate of 31 deaths per 100,000 workers. In addition, some 2,000,000 persons were injured at work, of whom some 80,000 suffered permanent impairments, and the remainder suffered injuries which were disabling for one day or more.

The economic value of the time lost from these injuries in terms of wages alone was $680,000,000, for part of which the workers were reimbursed under the various compensation plans. The cost of medical expense was approximately $100,000,000, and the cost of insurance, exclusive of claims paid, was about $240,000,000. These costs, together with the losses due to property damage or production delays, resulted in a total economic loss to the nation of $2,300,000,000 from occupational accidents alone.

Paper SKETCHES . . . . . .

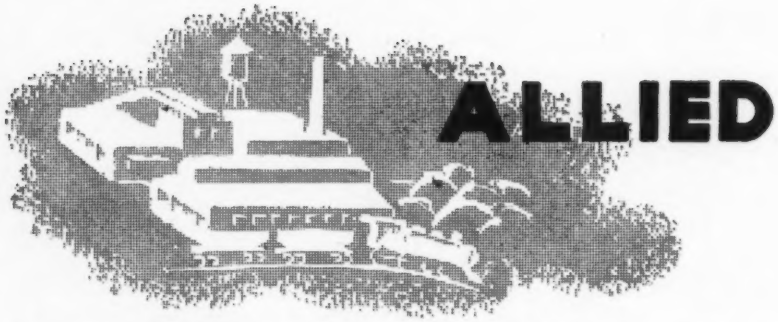
LATE IN THE 1700'S CHANCELLOR ROBERT R. LIVINGSTON, EARLY AMERICAN ARISTOCRAT, CO-AUTHOR OF THE DECLARATION OF INDEPENDENCE, DELEGATE TO THE CONTINENTAL CONGRESS AND PROMOTER OF FULTON'S STEAMBOAT, CONFIDENTLY EXPECTED TO MAKE A FORTUNE FROM THE USE OF FROG SPITTLE—A KIND OF WATER PLANT—FOR PAPERMAKING

THE NEWSPRINT MILLS OF CANADA HAVE A COMBINED PRODUCTION CAPACITY OF 4¼ MILLION TONS A YEAR, MORE THAN 90% OF THE OUTPUT IS EXPORTED

QUEEN

ELIZABETH OF ENGLAND GRANTED JOHN SPIELMAN, PAPERMAKER, A LICENSE IN 1589 FOR THE SOLE GATHERING OF ALL RAGS OVER A PERIOD OF SOME YEARS FOR PAPERMAKING.

THAT THE MAKING OF PAPYRUS DATES BACK AT LEAST TO 3536 B.C. IS PROVED BY THE DISCOVERY OF A SHEET OF THE SUBSTANCE CONTAINING ACCOUNTS WRITTEN DURING THE REIGN OF THE EGYPTIAN PHARAOH, ASSA (3580-3536 B.C.)



ROBINS CONVEYORS MARK 50TH ANNIVERSARY—TELL PLANS FOR EXPANSION

At a recent celebration on the occasion of the company's fiftieth anniversary, Robins Conveyers, Inc., Passaic, New Jersey, announced plans for the construction of a new manufacturing building.

Ground actually was broken for the new building by Thomas Robins, Sr., founder of the company and present chairman of the board. During the anniversary program, Mr. Robins was presented with a historical memento. Other features were the awarding of service pins to employees and an outline of expansion plans by President Thomas Robins, Jr.

President Robins revealed details of the new building. He said that it would be of the most efficient modern design and equipped with many special machines. He further stated that the company now has an all-time record backlog for conveyors and related equipment.

◆

CONSOLIDATION OF AMER. CYANAMID SUBSIDIARY WITH PARENT COMPANY

The business of American Cyanamid and Chemical Corporation, a subsidiary, was consolidated with its parent company, the American Cyanamid Company, New York City, on July 31. Hereafter the business of the Chemical Corporation subsidiary will be operated as the Industrial Chemicals Division of American Cyanamid Company.

The consolidation just effected is in line with a general plan for the simplification of the corporate structure of the Cyanamid organization.

◆

▶▶▶ SERVICE PINS will be awarded during the summer with ceremonies to be held at the nine plants and numerous offices of Pennsylvania Salt Manufacturing Company, Philadelphia. Gold pins will be given to those with five, ten, fifteen or twenty years of service. Twenty-five year employees will receive pins on which a diamond takes the place of numerals; they also will be given certificates of membership in the Diamond Keystone Club. Thirteen hundred employees will be honored, with a total of 22,727 years of service.

◆

BERT HOLUB ORGANIZES COMPANY—WILL MAKE ELECTRICAL PRODUCTS

A new concern recently organized by Bert E. Holub will manufacture electrical and mechanical products in its new plant at 413 DeKalb Avenue, Sycamore, Illinois. The company will operate under the name Holub Industries, Inc.

Mr. Holub was formerly an officer and general sales manager of Ideal Industries, of Sycamore. He resigned from that company in January of this year, terminating an association of 24 years.

The Holub trademark "HI" will appear on an extensive line of products. Arrangements are being made for representation in important overseas markets.

Gordon W. Wetzel, formerly Mr. Holub's assistant at Ideal, has terminated his nine years with that company, and will be sales manager of the new concern.

◆

▶▶▶ RELOCATION of its executive offices is announced by the Allegheny Ludlum Steel Corporation. These offices are now located in the Henry W. Oliver Building, Pittsburgh 22. General offices of the company will remain at Brackenridge, Pennsylvania. The Pittsburgh District Sales Office will remain in the Henry W. Oliver Building.

◆

HYSTER'S NEW DANVILLE PLANT IN PRODUCTION

Production has begun at the new Danville, Illinois, plant of the Hyster Company (other plants are located at Portland, Oregon, and Peoria, Illinois). The new plant which is engaged in the manufacture of 2,000 and 4,000 pound capacity fork-type lift trucks has not reached full production schedule, but deliveries are being made, and it is expected that full schedule operations will be reached this fall.

Frank L. Ross

The plant operation is under the direct management of Frank L. Ross who is in charge of all eastern activities of the Hyster Company. The Danville factory manager is Jay Misenhimer, assistant factory manager, Jim

REDUCE REGISTER COMPLAINTS

If printers and lithographers will use the *Cambridge* Printer's Moisture Irdicator to determine the relative humidity of paper and pressroom, they are in position to avoid the most common cause of "off register." This accurate, rugged instrument has the measuring element enclosed in a blade for insertion between hung or stacked sheets. An adjustable index pointer is provided for fixing reference points.

Write for descriptive bulletin

CAMBRIDGE INSTRUMENT CO., INC.
3701 Grand Central Terminal, New York 17, N. Y.

CAMBRIDGE
PRECISION INSTRUMENTS

High wet-strength paper—paper that is extra strong when dry and when exposed to moisture—is giving new protection to foods, new convenience to the user, a new and profitable specialty to the paper manufacturer. Bags, vegetable and meat wrappers, labels for canned goods, barrel and crate liners—all these grocery and food store paper products are stronger, longer-lasting, more satisfactory when given the advantage of wet and dry strength imparted by PAREZ Resin 607.

PAREZ Resin 607 imparts improved wet and dry strength to any type of paper from paperboard to fine tissue. It also improves fold endurance, printing qualities, and wet-rub resistance. Paper stocks can be produced by simply adding PAREZ Resin 607, as outlined in Cyanamid's Technical Bulletin 9-B, in the regular paper manufacturing process.

We shall be glad to supply paper manufacturers with complete data on PAREZ Resin 607 and its applications for the production of tougher, stronger, "ready-market" papers.

American Cyanamid & Chemical Corporation

(A Unit of American Cyanamid Company)

30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

DISTRICT OFFICES: Boston, Mass.; Philadelphia, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Chicago, Ill.; Kalamazoo, Mich.; Detroit, Mich.; St. Louis, Mo.; Azusa, Calif.; Seattle, Wash. In Canada: Dillons Chemical Company, Ltd., Montreal and Toronto.

**Trade-mark of American Cyanamid & Chemical Corporation covering its synthetic resins for use by the paper industry. The processes under which PAREZ Resin is applied in the production of wet-strength paper are covered by U.S. Patent Nos. 2,291,079; 2,291,080; and 2,345,543; and U. S. Patent Application Serial No. 453,032.

LET'S *Check* THE CITY OF

Houston, Texas

Today, all of Houston's portable water supply—millions of gallons daily—is supplied by Layne Wells and Pumps. More than 250 complete Layne Well Water units are serving the city and such places as Hotels, Theatres, Laundries, Packing Houses, Ice Plants, Rice Mills, Steel Companies, Iron Works, Cement Plants, Ship Building Yards, Bottling Plants, Light & Power Services, Oil Field Tool Factories, Paper Mills, Pipe Line Companies, Oil Refineries, Cold Storage Plants, Chemical Plants and Breweries. Such outstanding preference is an exceptionally fine tribute to Layne's skill in building high efficiency wells and pumps.

Behind Layne Well Water Systems are seventy years of engineering research and practical experience. These Systems embody basic Layne developed and patented features which cannot be duplicated by others. Such exclusive and thoroughly proven superiority has made the name Layne world famous.

For the latest catalogs and bulletins, address Layne & Bowler, Inc., General Offices, Memphis 8, Tenn.

HIGHEST EFFICIENCY

Layne Vertical Turbine pumps are available in sizes to produce from 40 to 16,000 gallons of water per minute. High efficiency saves hundreds of dollars on power cost per year.

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Western Co. of Minnesota, Minneapolis, Minn. * International Water Supply Ltd., London, Ontario, Canada * Layne-Hispano Americana, S. A., Mexico, D. F.

LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

Woodley, purchasing agent, William Morrow, and office manager, Ray Smith.

◆

POWER PLANT EFFICIENCY PROJECT LAUNCHED BY ALLIS-CHALMERS MFG. CO.

A research project has been launched by Allis-Chalmers Manufacturing Company, Milwaukee, for the purpose of increasing power plant efficiency in the papermaking industry.

Steam turbine plant operators in the paper field are invited to participate in a co-operative study to increase their power plant efficiency through an analysis of the nature and cause of costly turbine blade deposits. This project is being conducted by Allis-Chalmers' water conditioning and steam turbine departments.

The company offers to analyze without charge or obligation steam turbine blade deposits from any make of turbine operating at throttle pressures of 350 pounds or higher, provided samples of blade deposits are taken in accordance with certain recommended procedures.

◆

▶▶▶ A METALLURGY DIVISION has been announced by General Electric Chemical Department, with headquarters at Pittsfield, Massachusetts. The new division, representing the third operating unit to be incorporated in the chemical department, will handle the sale of various types of permanent magnets and metallurgical products.

◆

▶▶▶ A REDUCTION OF 30 cents a hundredweight in the price of industrial starches and 25 cents a hundredweight in the price of Sweetose and corn syrup has been announced by A. E. Staley Manufacturing Company, Decatur, Illinois. These changes became effective July 24.

◆

CHANGES IN B. C. AMES COMPANY ORGANIZATION

Reorganization of the B. C. Ames Company, Waltham, Massachusetts, has been announced. Warren Ames has been elected president of the company, and H. G. Haynes has assumed the duties of treasurer. This 47-year-old company will continue to manufacture micrometer dial gauges and micrometer dial indicators.

The B. C. Ames Company has sold its manufacturing rights to the Ames Bench Lathes, Milling Machines, and Hardness Testers to the Ames Precision Machine Works. This latter company is owned by Ira R. Ames, a former affiliate of the B. C. Ames Company.

PAPER CONVERTING MACHINE CO. CONTROL PASSES FROM CHRISTMANS TO LESTER WOOD

The controlling interest in Paper Converting Machine Company, Green Bay, Wisconsin, has been purchased from the Christmans by Lester G. Wood, vice president and treasurer of the company since 1936.

B. L. Walter, president of the company, continues in that office. He

Lester G. Wood

and Mr. Wood are the only old stockholders remaining with the company.

Peter J. Christman, one of the founders of the company, while retiring from active business connection, will continue as consultant in the development of new machines and the business in general. He has been vice president of the company in charge of manufacturing until the first of this year when be became chairman of the board.

E. M. Kwitek, who has been with the company since 1929, will be in charge of manufacturing. Dan Nystrand, chief enegineer, will continue in that capacity under the new management.

Prior to his purchase of stock in Paper Converting in 1936, Mr. Wood was associated with the Northern Paper Mills, of Green Bay, as vice president in charge of sales, and assistant general manager.

◆

▶▶▶ IN UPPER NEW YORK State the O'Brien Specialty Company, Syracuse, will act as authorized agent for the Warren Steam Pump Company, Incorporated, Warren, Massachusetts. William J. O'Brien, president of the Specialty company, has had long experience in the field of manufacturers

Permanent YELLOWS for PAPER

Mapico Yellows...

are light-fast and highly resistant to acids and alkalies. These fine pigments are pure precipitated iron oxides . . . available in 6 shades. Reduction with white provides a wide and pleasing range of clean creams, ivories and buffs.

All of the Mapico Colors are ideal pigments for papers. Their fine particle size, high tinting strength, good fiber adhesion, soft texture and permanent color have made them favorites throughout the paper industry.

You can depend on the uniformity of Mapico Colors.

Look to MAPICO *for Leadership*

MAPICO Colors

COLUMBIAN COLORS

PURE OXIDES OF IRON

YELLOWS • REDS • BROWNS • BLACK

We will gladly send samples and complete technical information.

COLUMBIAN CARBON COMPANY
MAGNETIC PIGMENT DIVISION
MANUFACTURER
BINNEY & SMITH CO., *Distributor*
41 East 42nd Street • New York 17, N. Y.

In Clover ... *with* BRASS BOLTS

This is a "Milk Factory" . . . producing milk for butter, cheese and other products of the great Food Processing Industry.

No brass bolts in a cow? Of course not, but her health and the quality of her products are constantly guarded by non-rusting, non-corroding alloys.

Harper maintains a stock of more than 4850 different types of bolts, nuts, screws, washers, etc., made from Brass, Bronze, Monel Metal and Stainless steel. Special engineering service is constantly available.

Wherever there is danger of rust or corrosion from moisture, acid or alkali consult your nearest factory branch or distributor.

The H. M. HARPER COMPANY
2647 Fletcher St.
Chicago 18, Illinois
Branch Offices: New York City, Los Angeles, Philadelphia, Dallas, Milwaukee, Cincinnati
Representatives in Principal Cities

Cast Aluminum and Brass drinking bowl by the H. E. Bremer Manufacturing Co. of Milwaukee, using Harper Brass pins, bolts, nuts and screws reduces bacterial breeding pockets to a minimum

HARPER
Everlasting Fastenings
Chicago

agency work. In the mid-west the Jarvis Equipment Company, Cincinnati, Ohio, will handle Warren's products in the southern section of Indiana, Ohio, West Virginia, and the state of Kentucky.

◆

▶▶▶ THE CHEMICAL WARFARE plant owned by the Government at Monsanto, Illinois, has been leased by Monsanto Chemical Company (St. Louis) for the manufacture of a series of peacetime products. Approximately $1,000,000 will be spent in altering the plant and building additions. The conditions of the lease specify that Monsanto will keep the equipment intact and ready the plant for wartime production should a national emergency occur.

◆

BUSINESS OF AMERICAN SPIRAL SPRING ACQUIRED BY H. K. PORTER COMPANY

The business of the American Spiral Spring and Manufacturing Company, of Pittsburgh, has been acquired by H. K. Porter Company also of Pittsburgh.

The new acquisition, together with the Porter Fort Pitt Spring Plant, will be operated as the American-Fort Pitt Spring Division of the H. K. Porter Company, Incorporated. This expansion is in accordance with the Porter company's previous policy of developing its railway supply and specialty business.

It is pointed out by T. M. Evans, president of the Porter company, that the new acquisition not only expands the company's spring capacity, but also adds a modern wire spring plant.

◆

▶▶▶ CONSOLIDATION OF the Philadelphia office of the Robins Conveyors, Incorporated (Passaic, New Jersey), with the office of Hewitt-Robbins, Incorporated, will be effective September 1. The Robins Conveyors office will be moved from 12 South Twelfth Street to the parent company's office at 401 North Broad Street, Philadelphia 8, Pennsylvania.

◆

▶▶▶ ORDERS FOR SECTIONAL paper mill drives booked by the Reliance Electric and Engineering Company, of Cleveland, have topped all records in its historty of forty-one years. Amounting approximately to three-quarters of a million dollars in purchases of electric motors, generators, and control equipment, the orders include electric drives for machines to make book paper, tissue, newsprint, and board.

◆

▶▶▶ FOR THE PAST 50 YEARS the Pittsburgh Plate Glass Company has maintained an extensive system of warehousing. The organization of the warehouse system began in 1896 as a means of developing an adequate method of distribution. At the present time the company through its warehouse network can service all the principal cities. Essentially the warehouse in each locality is a small factory designed to process glass products for the needs of the customers in the community.

◆

▶▶▶ EQUIPMENT FOR printing flexible-corrugated has been installed by the Sherman Paper Products Corporation, Newton Upper Falls, Massachusetts. The new equipment allows the printing in any one color of any over-all design, trade-mark, and slogans.

◆

RULES FOR NEW LINCOLN CONTEST ARE NOW READY

Rules and conditions of the award program offered annually to industry by the James F. Lincoln Arc Welding Foundation are now being distributed.

The Foundation was created in 1936 through a deed of trust to encourage and stimulate scientific interest and scientific research, study and education in respect of the development of the arc welding industry through advancement in knowledge of design and practical application of the arc welding process. The award program has paid $200,000 annually in awards.

The present program which closes June 1, 1947, provides 452 awards for papers embracing every field of industry and research where arc welding may be applied with attendant benefits. Full information may be obtained from the Foundation, Cleveland 1, Ohio.

Swiss engineers visit Allis-Chalmers

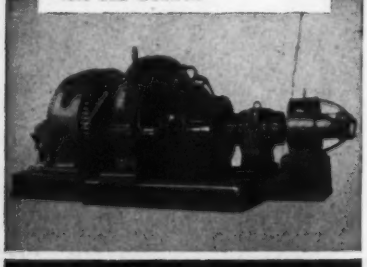
Interested in American-built machinery for their paper mills, four Swiss engineers recently visited the export department of Allis-Chalmers Mfg. Co., Milwaukee. Left to right: Felix Eisenmann, of the Biberist Paper Mill, Biberist, Switzerland; John Fritz, A-C representative of the Saw and Pulp Mill Sales Section; H. B. Reisfeld, A-C export department; Hans Hess, also of the Biberist Paper Mill; R. K. Prince, A-C cellulose industries specialist; Siegfried Aeschbacher, Utzenstorf Paper Mill, Utzenstorf, Switzerland; and Bernard F. Ziegler, A. Ziegler & Co., Basel, Switzerland

GUARANTEED
POWER EQUIPMENT

A Complete Service in Either Rebuilt or New

REBUILDERS OF . . . A.C. and D.C. Motors, Generators, M-G Sets, Pumps, Control Equipment, Transformers, Switchboards, Alternators.

DISTRIBUTORS OF . . . Rockwood Drives and Bases, Falk Couplings, Modern Motor Drives, General Electric Motors and Control.



CHICAGO ELECTRIC CO.
1313 West 22nd Street
Chicago 8, Illinois

TAYLOR

Spiral Welded PIPE

Rugged strength, light weight and low cost combine to make Taylor Spiral Welded Pipe ideal for a wide range of services in all fields of industry.

Sizes from 6" to 42" . . . Thicknesses from 12 to 8 gauge . . . Joint lengths up to 40 feet . . . All types of end joints, fittings and fabricated assemblies.

TAYLOR FORGE & PIPE WORKS

General Offices & Works: Chicago, P.O. Box 485
New York Office: 50 Church Street
Philadelphia Office: Broad Street Station Bldg.
Los Angeles Office: Oviatt Bldg.

SOUTHERN SAFETY GROUP HOLDS TWO-DAY MEETING WITH ECUSTA AND CHAMPION

A two-day safety conference was held on July 22 and 23 with two paper mill organizations in North Carolina as hosts. The conference, attended by thirty-eight delegates from eleven states, was a meeting of the Southern Pulp and Paper Safety Association which was organized last November (Cf. P.I. and P.W. Nov., 1945). The meeting was divided: the first day's sessions being at the Ecusta Paper Corporation plant in Pisgah Forest (N. C.); the second day, the Champion Paper and Fibre Company at Canton (N. C.) acted as host.

The morning of the first day was given over to a tour of the Ecusta plant where cigarette paper is made. The group was entertained at luncheon in the company cafeteria after which the conference assembled for a busines session. Raymond Bennett, general superintendent of Ecusta (also first vice president of the American Pulp and Paper Mill Superintendents Association), opened the meeting with a welcome address, to which response was made by D. J. Brett, Jr., safetey director of the National Container Corporation, Jacksonville, Florida.

Mr. Bennett then addressed the conference with some very helpful points on accident prevention work in industry. His subject was "Management's Responsibility in a Plant Safety Program."

Another address during the afternoon session on the subject "Unusual Paper Mill Accidents," was given by O. J. Sherman, safety director of the Gaylord Container Corporation, of Bogalusa, Louisiana.

Another interesting feature of the afternoon session was a panel discussion on mutual safety problems, led by H. E. Newbury, safetey director of Ecusta Paper Corporation and chairman of the conference.

At the close of the first afternoon

AT THE ASHEVILLE CONFERENCE

Some industry representatives who attended the Southern Pulp & Paper Safety Association at Asheville (N. C.) are shown on the opposite page. The groups read from left to right.

No. 1—Starlus Rigell, H. F. Debo, Jr., C. A. Howard, C. L. R. Dougherty, and Robert W. Gray.

No. 2—G. W. Johnson, R. B. Hohn, C. O. Alexander, John D. Eversman, and G. R. Merriman.

No. 3—Everette B. Long, E. W. Brown, Gilbert W. Biron, George H. Smith, and E. F. Hansen.

No. 4—Ray Bounds, D. B. Lay, G. F. Williams, George H. Whiteside and George R. Golden.

No. 5—Fred Schmidt, Dallas E. Henry, Walter Irvin, E. G. Allison, and Elmo Bourg.

No. 6—George W. Harper, H. P. Carruth, A. H. Owens, Russell E. Bell, and H. K. Williams.

No. 7—T. R. Wilson, George P. Singer, W. H. Morgan, D. J. Brett, Jr., and Thomas Furness.

No. 8—H. E. Newbury, O. J. Sherman, and Vincent F. Waters.

Panel discussions and stirring addresses on various aspects of the industrial safety on various industrial safety problems proved most profitable to the delegates who attended the two-day conference of the Southern Pulp and Paper Safety Association

ville,

the
lpful
work
Man-
Plant

fter-
usual
n by
f the
, of

f the
scus-
, led
ector
and

rnoon

who
Paper
d. C.)
. The

, Jr.,
, and

Hohn,
, and

rown,
, and

G. F.
and

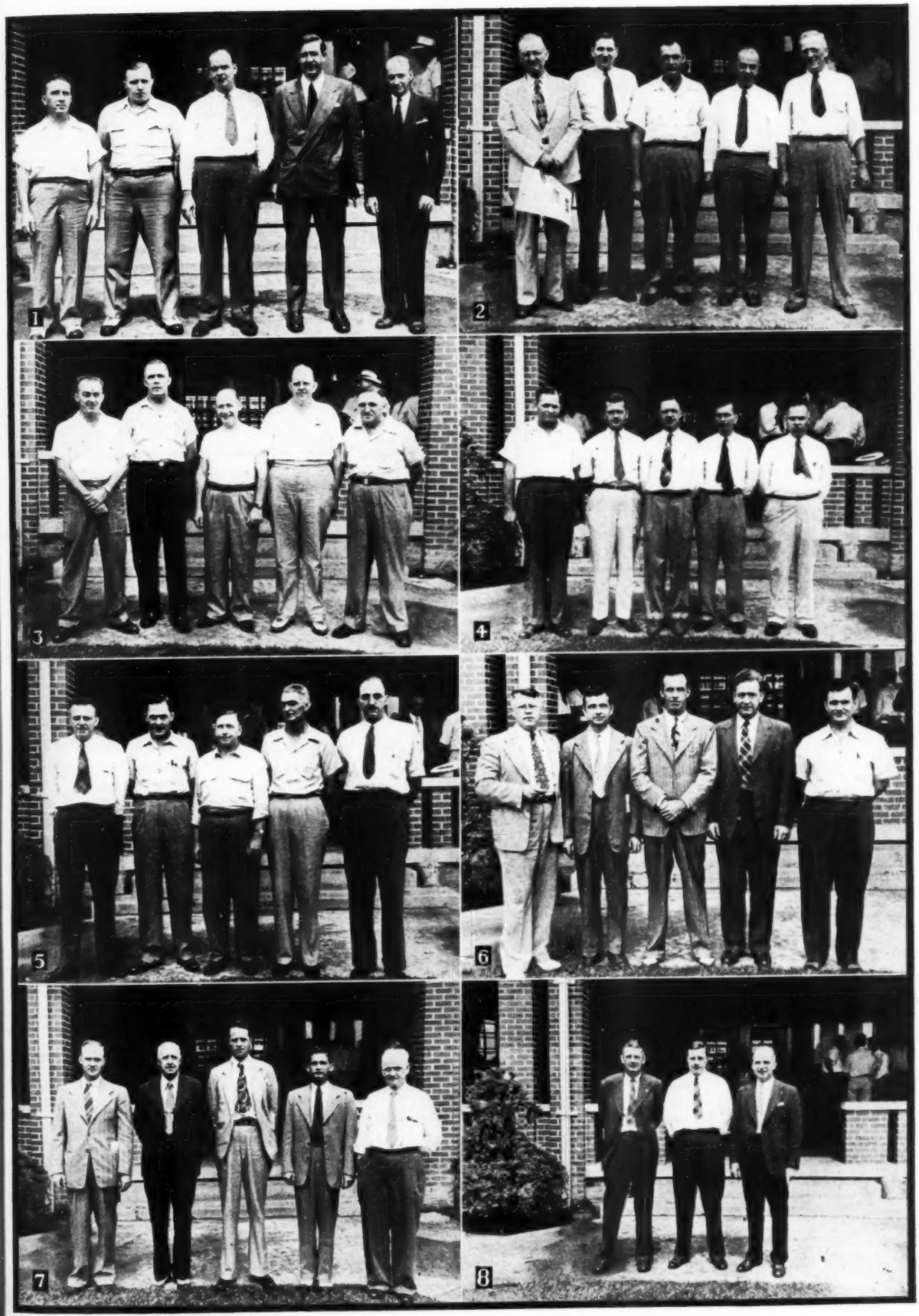
lenry,
Elmo

Car-
, and

inger,
and

rman,

, 1946


1
2
3
4
5
6
7
8

In the front row of this group are the directors of the Southern Pulp and Paper Safety Association. Left to right: C. A. Howard, O. J. Sherman, D. J. Brett, Jr., H. E. Newbury, G. R. Merriman, and Thomas Furness

session, by-laws which had been drawn at a committee meeting in Atlanta in February were presented. Following a short discussion, the by-laws were adopted.

The second day of the conference was held at the plant of the Champion Paper and Fibre Company at Canton, North Carolina. In the forenoon, the group was taken on a trip through the plant following which lunch was served. Entertainment had been provided to make

At the beginning of the afternoon session, welcome from Champion was extended by H. A. Holder, general superintendent. H. E. Newbury, chairman of the conference and safety director of Ecusta, responded.

Thomas Furness, safety director of the Champion Paper and Fibre Company, acted as co-chairman. Mr. Furness presided over a very interesting panel discussion which formed the main feature of the afternoon. Questions regarding many paper mill safety problems were brought into the forum which evoked a great deal of helpful comment.

Below—H. E. Newbury, safety director of Ecusta Paper Corp., and chairman of the Conference, presided over a panel discussion during the first day's session

Above—Raymond Bennett (standing), general superintendent of Ecusta Paper Corp., made the welcome address at the opening session. D. J. Brett, Jr. (seated at left), made the response

D. J. Brett, Jr., safety director of National Container Corp., is shown responding to welcome extended delegates to the conference

At the close of the conference the following directors were elected to serve through the next meeting which will be held at the Union Bag and Paper Corporation, Savannah, Georgia, in April, 1947: Robert W. Gray (chairman), H. B. Carruth, George Merriman, Dallas Henry, and D. J. Brett, Jr.

SAFETY CONTEST SCORES

The annual contest among mills in the Paper and Pulp Section of the National Safety Council closed June 30.

Due to the fact that all reports must be in before final scores can be published, additional time is needed to figure scores following the close of the contest. Therefore, the final scores, as of June 30, were not ready when this issue went to press.

Watch this section for closing figures on the contest.

COUNCIL OF SAFETY MAKES AWARDS TO WISCONSIN FIRMS

Awards have been made by the Wisconsin Council of Safety. The Downing Box Company, Milwaukee, was the winner of the first place award for the greatest improvement in accident frequency rate in 1945. A certificate of honor was given to the Bay West Paper Company, Green Bay, Wisconsin, for no lost time due to accidents. The Kimberly-Clark Corporation of Niagara and the Colon Company, of Madison, were cited for improvements in safety.

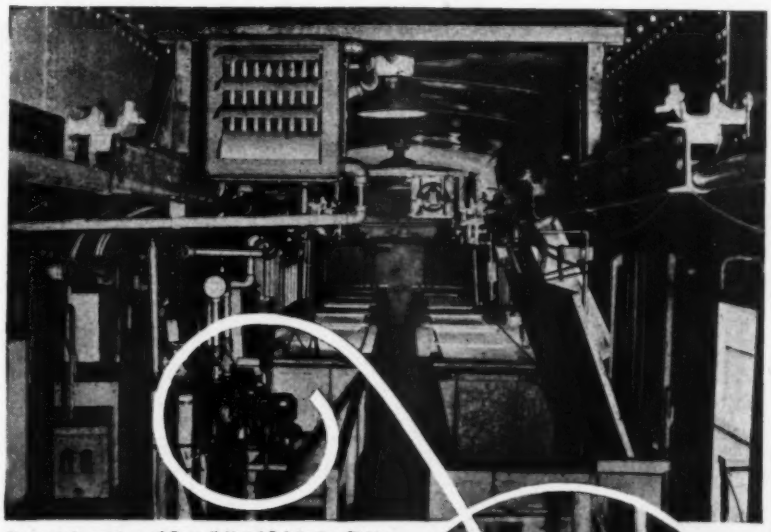
Recently elected officers of the Wisconsin Council of Safety are: F. W. Braun, Employers Mutual, Wausau, president; E. A. Page, Kimberly-Clark, Neenah, and D. M. Carson, U. S. Rubber Company, Eau Claire, vice presidents; H. A. Klemm, Wisconsin Industrial Commission, secretary-treasurer.

◆

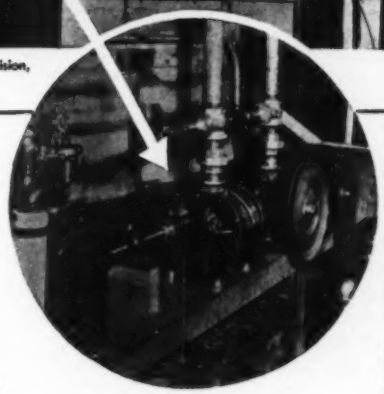
NEW OFFICERS TO HEAD SAFETY RESEARCH INST.

The newly elected president of the Safety Research Institute, Incorporated, New York City, is Brahana Chalefman Hutchins. Mrs. Hutchins has been with the Institute since 1940; she is the widow of the late Leroy W. Hutchins, well known publicist and former president and treasurer of the organization. During her career, Mrs. Hutchins has prepared numerous articles in the field of fire safety and industrial hygiene, and she has collaborated in the writing of educational material in the safety field.

At the time of the election of Mrs. Hutchins to the presidency of the Institute, Frank Arnoldi was re-elected as vice president; Robert Nathans was newly elected as a vice president; and Angela B. Danials was elected secretary and treasurer.



Photographs courtesy of Farwell Metal Fabricating Division, St. Paul, Minnesota.



Fish need Air Conditioning, too!

Fresh-water fish travel first class, in specially built railroad cars, from Minnesota's lakes to large metropolitan markets.

The water in which they are kept hale, hearty and alive is aerated by means of Roots-Connersville Rotary Positive Blowers, from loading time to unloading time. A unique arrangement permits blowers to be driven by steam turbines, electric motors or gasoline engines. The same pipes that carry air can be used for fresh water to refill the tanks.

This illustrates the wide usefulness of Roots-Connersville Blowers. If you have a problem of moving air, gas or liquids under moderate pressures, our engineers will gladly help you do the job most economically and profitably.

Roots-Connersville Blower Corp.
One of the Dresser Industries
608 Monroe Avenue, Connersville, Indiana

Roots - Connersville engineering is distinguished by the *"dual-ability"* to furnish either Rotary Positive or Centrifugal Blowers, whichever are best adapted to the job to be done. Because we build both types, we give you unbiased recommendations to help solve your blower problems.

Roots Connersville Since 1854

BLOWERS FOR EVERY NEED

ROTARY POSITIVE AND CENTRIFUGAL BLOWERS • EXHAUSTERS • BOOSTERS
LIQUID AND VACUUM PUMPS • METERS • INERT GAS GENERATORS

ASSOCIATIONS

FIRST NAT'L INSTRUMENT CONFERENCE AND EXHIBIT

The first National Instrument Conference and Exhibit will be held September 16-20 in the William Penn Hotel, Pittsburgh. The theme of the Conference, "Instrumentation for Tomorrow," is sponsored by The Instrument Society of America and was planned to stimulate the greater use of instruments to increase productivity and reduce costs, thus improving our standard of living.

Meeting jointly during the same week will be the Instruments and Regulators Division of the American Society of Mechanical Engineers, who have arranged for three technical sessions.

The Pittsburgh General Committee of The Instrument Society of America under the chairmanship of R. J. S. Pigott has arranged a very interesting technical program of 15 technical sessions.

Short courses in industrial instruments, machine shop measurements, optical measurements, and electrical measurements are being arranged at the Carnegie Institute of Technology under the direction of Dr. B. B. Teare, Jr., head of the Electrical Engineering Department. All interested in taking these courses should register with the secretary, The Instrument Society of America, 1117 Wolfendale Street, Pittsburgh 12, Pennsylvania.

◆

WAXED PAPER INSTITUTE HOLDS SUMMER CONVENTION

Representatives of nearly all waxed paper companies attended the Waxed Paper Institute convention held at French Lick, Indiana, June 27 and 28. Labor relations, merchandising activities, and OPA rulings were discussed at the meeting.

R. C. McCaskey, vice president, Minerva Wax Paper Company, and chairman of the waxed paper industry Advisory Committee, reported in detail on the latest OPA rulings and the possibility of further increased raw paper stock which would directly affect all waxed paper converters. S. S. Kittele, attorney for Waxed Paper Institute, and OPA representatives W. Wucher and S. J. Blair also discussed various aspects of pricing restrictions.

The Merchandising Committee, headed by R. A. Nash, manager of Bakery Division of Marathon Corporation of Menasha, Wisconsin, gave a comprehensive report on the Institute National Merchandising Program and discussed promotional plans for the coming fiscal year.

P. J. Massey, vice president, H. P. Smith Paper Company, and chairman of the Institute's Industrial Relations Program, made a report which set forth the value of job evaluations. He exhibited charts made from a wage survey of the industry, which showed the importance of paying labor in relation to production; also, to provide vacations and gratuities in relation thereto for wholesome personnel relationship between management and labor.

After his speech, Mr. Massey announced his retirement from the waxed paper industry and as Chairman of the Waxed Paper Institute Industrial Relations Committee. T. A. Sullivan, factory manager at H. P. Smith Paper Company, was appointed as his successor as chairman of this program activity and M. M. Bartley, purchasing director of Rapinwax Paper Company, Minneapolis, Minnesota, was appointed vice chairman.

At Waxed Paper Institute meeting at French Lick, Indiana, these men checked over newspaper publicity clips: (L to R) B. F. Lacy, Southern Waxed Paper Co.; James Herndon, Zimmer Paper Products; G. C. Wieman, Western Waxed Paper Co.; and P. J. Massey, H. P. Smith Paper Co. (Mr. Massey has since retired; Cf. P. I. and P.W., July, 1946)

◆

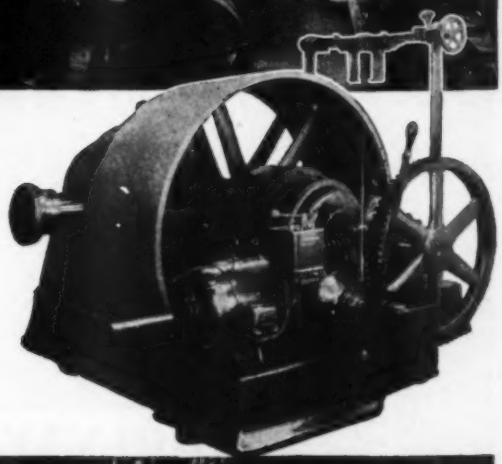
CHEMICAL EVENTS IN CHICAGO

Two major events during the week of September 9 are being sponsored by the Chicago Section of the American Chemical Society. This week will be of definite interest not only to chemists and chemical engineers but also to others interested in any branch of science.

The fall meeting of the American Chemical Society will be held September 9-13 with headquarters at the Palmer House.

The second event which is of general interest is the Fourth National Chemical Exposition to be held at the Coliseum, September 10-14. There will be on display apparatus, equipment, and products made by several hundred manufacturers, chemical and otherwise. There will be a continuous showing of sound movies, some of which will be colored, on industrial, scientific and general subjects. A new educational exhibit "Chemical Trail Blazers" depicting recent research accomplishments will be on display. The Special Libraries Association is presenting an exhibit indicating how specialized libraries contribute to the success and speed of research work. Atomic energy will be featured in a

LIFE and LIMB AHEAD OF PRODUCTION



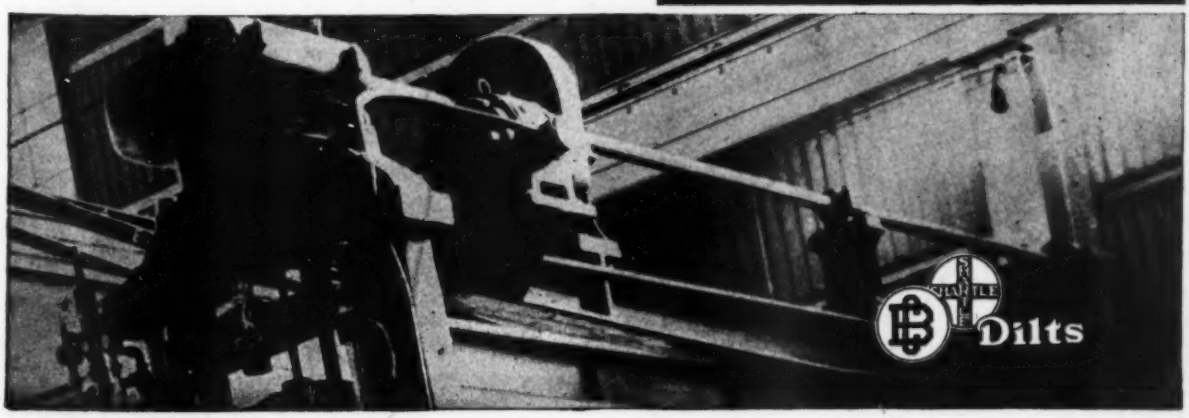
Makes a good slogan . . . for "safety" should come first in every mill. B-C herewith hands you a few Safety-First suggestions well worth considering:

1. *Install a B-C Sheehan carrier*—First, to protect the men; second, to save time and reduce broke.
2. *Install a B-C electric calender lift*—First, to reduce the hazard; second, to facilitate raising of the rolls for cleanup.
3. *Install a B-C dryer inching drive*—First, to provide greater safety; second, to back up your dryers.
4. *Install a B-C calender reversing drive*—First, to eliminate danger; second, to speed plug ejection and reduce broke.

Not only will such equipment afford needed protection—it will also save time, cut down on broke, and gradually pay for itself.

THE BLACK-CLAWSON COMPANY, Hamilton, Ohio

Divisions: Shartle Bros. Machine Co., Middletown, Ohio
Dilts Machine Works, Fulton, N. Y.
Associate: Alexander Flack Limited, Ottawa, Canada



special exhibit of the American Chemical Society prepared under the personal direction of Walter J. Murphy.

◆

PAPERMAKING BIBLIOGRAPHY COVERING YEARS 1936-45

A collective bibliography of articles and books relating to the manufacture of pulp and paper, and covering the years 1936 to 1945 is in the process of preparation by the Technical Association of the Pulp and Paper Industry.

Although the bibliography is being prepared primarily for the benefit of members of TAPPI, a limited number of copies will be available to nonmembers, libraries, etc., at $10.00 per copy. Because the number of copies to be printed is limited, orders should be sent to the Association immediately.

Previously, a bibliography was prepared by TAPPI covering the period 1900 to 1935. These editions are now out of print but can be secured in many public libraries.

The pulp and paper industry is probably the only industry that has presented in book form a complete record of its published literature over a period of forty-six years. The compilation was made by Clarence J. West, who is now with the Institute of Paper Chemistry. In 1937 Dr. West received the gold medal TAPPI award.

◆

NATIONAL POWER SHOW TO BE COMPREHENSIVE SURVEY OF INDUSTRY

The 17th National Exposition of Power and Mechanical Engineering to be held next December 2 to 7 at the Grand Central Palace, New York City, promises to be the most comprehensive of its kind, as well as the largest ever held.

The exposition is designed to serve the interests of the consumers of power from the coal pile or oil tank to the machine tool or processing operation.

General arrangements for the show are being developed along previous lines with courtesies being extended to visiting members of engineering societies and professional groups which will be meeting in New York during the time of the exposition.

Charles F. Roth is manager of the exposition, and E. K. Stevens is associate manager.

◆

COMING EVENTS

Sept. 9-13—Fall meeting American Chemical Society, Palmer House, Chicago.

Sept. 10-14—National Chemical Exposition, The Coliseum, Chicago.

Sept. 13-14—Fall meeting of the Northeastern Division of the American Pulp and Paper Mill Superintendents Association, at Mount Washington Hotel, Bretton Woods, New Hampshire

Sept. 12-14—N. Y.-Can. Div. American Pulp and Paper Mill Superintendents Association, Sagmore Hotel, Bolton Landing on Lake George.

Sept. 16-20—First National Instrumentation Conference and Exhibit, Wm. Penn Hotel, Pittsburgh, Pa.

Sept. 17-19—Ohio State Safety Conference, Hotel Statler, Cleveland, Ohio.

Sept. 26-28—Fall meeting of the Technical Association of the Pulp and Paper Industry, Statler Hotel, Detroit, Mich.

Oct. 2-4—TAPPI Engineering Conference, Hotel Pfister, Milwaukee, Wis.

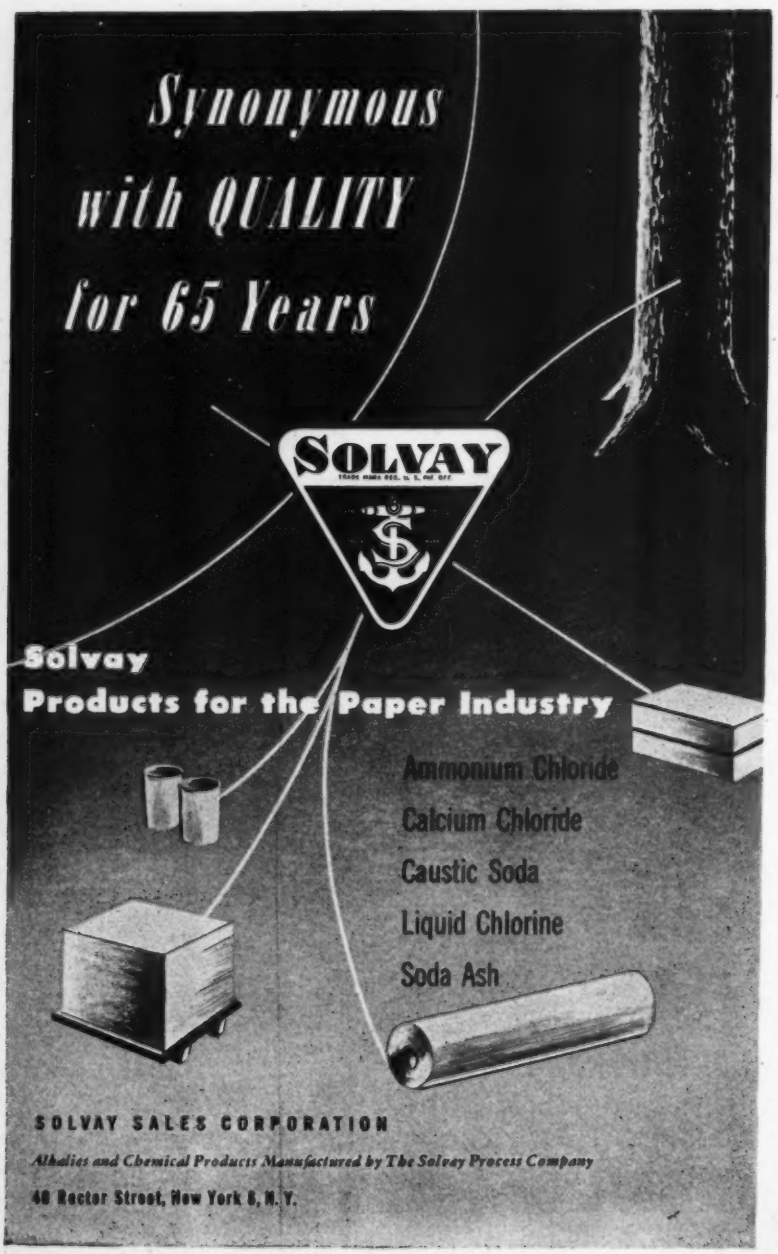
Oct. 7—National Safety Congress, in Chicago. Headquarters and exhibits at Stevens Hotel. Meetings may be held in Stevens, Palmer House, and Congress Hotels.

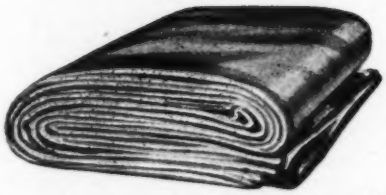
Oct. 17-19—National Paper Trade Ass'n, Fall Convention, Edgewater Beach Hotel, Chicago.

Nov. 14-16—Joint meeting Southern and Southeastern Divisions American Pulp and Paper Mill Superintendents Association, George Washington Hotel, Jacksonville, Fla.

Dec. 2-7—17th National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.

Dec. 6-7—Pacific Coast Division American Pulp and Paper Mill Superintendents Association, New Washington Hotel, Seattle, Wash.





The finish of a sheet of paper or board begins when it is *formed* —on the wet end of the machine. The slightest unevenness in the surface of the felt results in uneven removal of water and leaves its own imprint on the surface of the finished product.

One of many reasons why manufacturers of high grade paper and board prefer Hamilton Felts is because Hamilton Felts remove water evenly and leave no impressions to be ironed out at the driers and calenders.

After it has been shrunk and fulled every Hamilton Felt is gently combed by a million needle-pointed cockle burrs (teasels) which free the matted fibers and *fluff* the nap until every square inch of its surface becomes an even and resilient cushion for the speeding web. Less heat is needed at the driers. No impressions mar the smoothness of the finish.

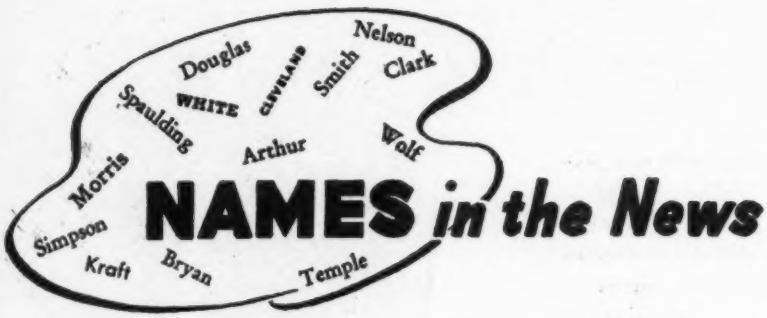
From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Miami Woolen Mills

Hamilton Felts

Established 1858



PERSONALS

IMPORTANT CHANGES AT MARATHON—STEVENS NOW PRES. CANADIAN COMPANY

Executive promotions in the Marathon organization became effective on July 16 when D. C. Everest, president of Marathon Corporation, announced the election of John Stevens, Jr., as president of Marathon Paper Mills of Canada, Ltd.

Mr. Everest has been president of both the Marathon Corporation, Rothschild, Wisconsin, and the Canadian affiliate company. He now becomes chairman of the board of Marathon Paper Mills of Canada, Ltd., but remains president of Marathon Corporation. Mr. Stevens, likewise, retains the office of vice president of Marathon Corporation. He has been associated with the organization as a production executive for the past 17 years.

Also announced is the election of Leo E. Croy as executive vice president in charge of all United States operations of Marathon Corporation, except the activities of the chemical division, and the election of Roy J. Sund as vice president in charge of all United States manufacturing, except chemicals. Mr. Croy, formerly vice president in charge of sales, has been associated with Marathon for 23 years in various sales and administrative positions.

John Stevens, Jr.

Donald A. Snyder has been appointed director of sales for all Marathon products except chemicals. He has been with Marathon for 17 years, most recently as sales manager of the food packaging division, and will continue to direct that division in addition to assuming the sales administrative duties formerly handled by Mr. Croy.

Marathon's product development department, headed by Frank L. Broeren, has been expanded to include sales engineering. The growing importance of packaging machine applications will receive the special attention of the sales engineering staff. Mr. Broeren has been connected with Marathon for more than 25 years in various sales and executive capacities. For several years he headed Marathon's jobber sales division.

◆

▶▶▶ Formerly in the production department of the New York and Pennsylvania Company (Lock Haven, Pa.), *Emil Colquist* has been appointed superintendent of the Castanea Paper Mill, of Lock Haven. He succeeds John Davies who has retired after a score of years with the Castanea mill.

◆

GEO. W. FARRINGTON ELECTED VICE PRESIDENT OF PAPER CORPORATION

The election of George W. Farrington as vice president of Paper Corporation of the United States, New York City, was announced on July 1. Mr. Farrington was the proprietor of the Farrington Paper Company which has been absorbed by Paper Corporation. For many years Mr. Farrington has been associated with the paper industry. He is a member of the American Institute of Graphic Arts and the Paper Club of New York.

Paper Corporation of the United States was formed thirty-seven years ago by the late Robert C. Osburn. The company was operated exclusively as a contractor for the United States Government. In 1945, Herbert J. Simonds purchased the company and was elected president. While the company's business with the government is still a major activity, the firm's policy is to branch into the commercial field. Mr. Farrington's duties will be those of formulating this commercial department.

◆

KIMBERLY-CLARK CHANGES

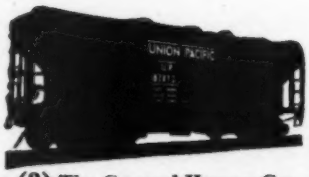
Recent promotions announced at the Kimberly-Clark office in Neenah, Wisconsin, elevated Karl Oberreich to the position of assistant general purchasing agent, and made William Meyer assistant to Lawrence Stedman, head of paper sales.

Among K-C changes recently in engineering are the transfer of William Kurt from Badger-Globe mill to staff engineering. The vacancy at Badger-Globe will be filled by Fred Gorgenson, development engineer. Out of the Service, Ray Pownail, Jr., has been transferred from Kimlark to Badger-Globe.

◆

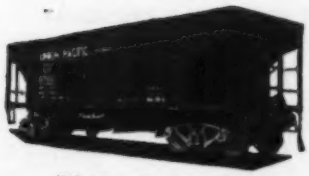
▶▶▶ The general sales manager of the Union Bag & Paper Corporation, New York City, *Leonard J. Doyle* has been elected vice president in charge of sales. Mr. Doyle has been a member of the Union Bag organization for thirty-four years, and he has served during that time as salesman, Chicago branch manager, Western sales manager, and general sales manager.

Leonard J. Doyle



(3) The Covered Hopper Car

(2) The Tank Car



(1) The Hopper Car

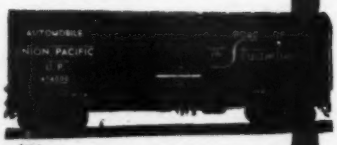
(4) The Livestock Car

(5) The Refrigerator (P.F.E.) Car

(6) The Box Car

(7) The Gondola

(8) The Flatcar



(9) The Automobile Car

UNION PACIFIC

Transportation Tailored to *your* INDUSTRY

To most effectively meet the needs of American Industry, Union Pacific provides a fleet of freight cars specifically designed to transport all types of materials and merchandise.

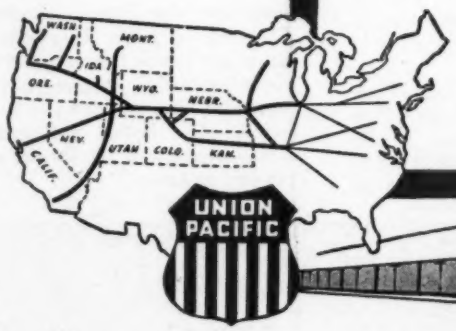
Sturdily constructed and efficient in mechanical operation are the various types of freight cars pictured on this page. This safe, dependable rolling stock is a vital factor in providing transportation for the commerce of the nation.

Of special interest to the Paper Industry is the box car, Fig. 6, used for the shipment of paper and many paper products.

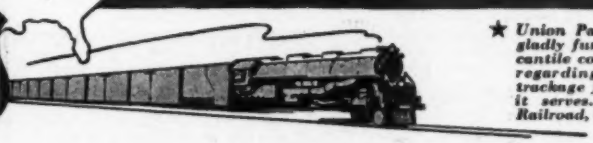
The trained knowledge and experienced skill of thousands of Union Pacific employees keep shipments rolling on schedule over the time-saving Strategic Middle Route, uniting the East with the West Coast. Experienced traffic specialists, from coast-to-coast, are ready to assist you. Let them help you with your *next* shipment.

For fast, dependable service . . .

be Specific – say "Union Pacific"



UNION PACIFIC



★ *Union Pacific will, upon request, gladly furnish industrial or mercantile concerns with information regarding available sites having trackage facilities in the territory it serves. Address Union Pacific Railroad, Omaha 2, Nebraska.*

UNION PACIFIC RAILROAD

The Strategic Middle Route

LIST RETIRES AS PRESIDENT OF LANGSTON—SUCCEEDED BY BRYANT W. LANGSTON

After thirty-one years of association with the Samuel M. Langston Company (Camden, New Jersey), L. J. List will resign as president and retire from active participation in the management of the organization on September 1. He will, however, continue as a member of the board of directors.

The management of the Langston Company will pass to Bryant W. Langston, son of the company founder, Samuel M. Langston, who has been elected president.

Further managerial changes announced by the Langston company include the election of Harry F. Appelstine, formerly comptroller, as treasurer of the company.

◆

▶▶▶ Sales activities in the Chicago area for the Graver Tank and Manufacturing Company (East Chicago, Indiana), will be headed by *Harold C. Conners* who will handle steel plate sales, and *Harold R. Fosnot* who will represent the Graver Process Equipment Division which specializes in water conditioning equipment. Both men were recently discharged from the Service.

◆

▶▶▶ The director of engineering of the Elwell-Parker Electric Company, Cleveland, *Clyde E. Cochran,* has retired. A long time associate of Mr. Cochran's in the Elwell-Parker organization, *Dwight Hanchett,* will succeed him. Mr. Cochran has been associated with Elwell-Parker for forty-four years; he is recognized as one of the most prominent engineers in the industrial truck field.

◆

▶▶▶ At a directors meeting on July 23, *Ernest Rossiter,* president of Southern Paperboard Corporation, was elected a director of Robert Gair Company, Inc., succeeding Edward K. Bachman.

◆

PERSONNEL CHANGES AT MARATHON-MENASHA DIV.

The appointment of W. H. Graebner as resident manager in charge of production at the Menasha (Wis.) plant of the Marathon Corporation was announced on July 23. Mr. Graebner has been with Marathon for 19 years, most recently as director of technical service and control at Menasha. He will be in charge of the waxed paper, carton, parafilm, paper mill and refinery departments. L. E. Simerl will take over Mr. Graebner's former activities. He is a graduate of the Institute of Paper Chemistry, with several years of experience in the paper industry. He was recently discharged from the Army after four years in the chemical warfare service.

John Staniak, with Marathon for 38 years, has been appointed general superintendent at the Menasha plant.

◆

▶▶▶ The broadening of its scope has made it necessary that the Northeastern Wood Utilization Council increase its staff. *Richard J. Brandekow*

Richard J. Brandekow

has been appointed field representative, and *Robert S. Aries* has assumed the position of director.

◆

▶▶▶ Before entering the Service in 1942, *Russell . Smith* represented the Crocker-McElwain Company in sales promotion work in the central and eastern territories. Mr. Smith has now been released from Service and is engaged in an orientation course in the Crocker-McElwain mill in Holyoke (Mass.) before rejoining the sales department.

◆

▶▶▶ For twenty-two years connected with the Kimberly-Clark Corporation, *Melvin Wingrove* recently has been named superintendent of the Falls Paper Company, Oconto Falls, Wisconsin.

◆

▶▶▶ The Council in London on July 12 elected *Cyril S. Kimball,* vice president of Foster D. Snell, Inc., as the American vice president of the Society of the Chemical Industry.

▶▶▶ After three and one-half years in the Service, *William R. Bowen* has returned to Farrel-Birmingham Company, Inc., as manager of the company's branch sales office at Akron, Ohio. He succeeds *Harry D. Temporal,* who will manage the F-B office in Chicago.

◆

ACKLEY TRANSFERRED TO PORT ANGELES—SUCCEEDS WM. EDWARDS, WHO RETIRES

After thirty-eight years of loyal service with the Crown Zellerbach Corporation, William Edwards, who recently held the position of superintendent of the company's newsprint mill at Port Angeles, Washington, has retired.

Charles E. Ackley, mill superintendent at Lebanon, Oregon, has been transferred to fill the vacancy at the Port Angeles mill. Mr. Ackley has had long experience in the paper industry; he recently was elected fifth vice president of the American Pulp and Paper Mill Superintendents Association.

To replace Mr. Ackley at the Lebanon mill, Elmer Davis has been appointed superintendent. Mr. Davis has been part of the Crown Zellerbach organizaton at Camas, and Port Townsend, as well as at Lebanon.

◆

▶▶▶ An employee of the Kimberly-Clark Corporaton's Kimberly (Wis.) plant, *Lyle L. Krick* became the 500,000th enrollee under the Wisconsin Blue Cross Plan of hospital care. Mr. Krick subscribed to the plan for himself, his wife, and four daughters on a family contract basis.

◆

▶▶▶ The new director of sales for the Dyestuffs Division of the DuPont Company is *Ambrose R. Chantler.* In the past Mr. Chantler has been director of Domestic Dyestuffs sales. He is succeeded by *Eric J. Monaghan.* The new assistant director of domestic dyestuffs sales is *Dr. Miles A. Dahlen.*

◆

▶▶▶ The newly appointed plant engineer of the Detrex Corporation (Detroit) is *J. D. Hamacher.* Mr. Hamacher joined Detrex in 1944 and worked as design engineer in the oil-extraction division. His new duties include plant layout and supervision of maintenance of the Detrex properties and buildings.

◆

▶▶▶ Retiring from military service after thirty-six years, Brigadier General *Donald Armstrong* has joined the staff of the American Standards Association as assistant to Howard Coonly, chairman of the ASA Executive Committee. General Armstrong's experience in the Ordnance Department and as Commandant of the Industrial College of the Armed Forces qualifies him for important work with ASA.

Lodding Custom-built Doctors for all Doctoring Needs

Breast Rolls . . . . . Wire Rolls . . . . . Couch Rolls (Plain-Grooved) . . . . . Press Rolls . . . . . Press Felt Rolls . . . . . Smooth Press Rolls . . . . . Dryers . . . . . Breaker Rolls . . . . . Calender Rolls . . . . . Reel Drums . . . . . Supercalender Rolls (Chilled Iron, Paper, Cotton) . . . . . Creping (Wet-Dry) Cutting-off Doctors . . . . . Cleaning Doctors . . . . . Yankee Dryer Doctors . . . . . Stack Dryers . . . . . Saturating Rolls . . . . . Oscillating Equipment

LODDING Precision Blades are ground straight and parallel to any degree of bevel. Your equipment deserves the best—LODDING

LODDING ENGINEERING CORPORATION

WORCESTER, MASSACHUSETTS, U. S. A.

Represented outside of New England by

W. E. GREENE CORPORATION

Woolworth Building NEW YORK

BUREAU OF ORDNANCE U.S.N. HONORS STAFF & EMPLOYEES OF FOREST PRODUCTS LAB.

The Bureau of Ordnance, United States Navy, has awarded staff members and employees of the Forest Products Laboratory, Madison, Wisconsin, certificates in recognition of their wartime research in plastic pulp, paper, wood, and other products. The certificates were signed by Rear Admiral G. F. Hussey and presented to the staff by Captain Jack E. Huff.

Those receiving the awards were: Carlisle P. Winslow, former laboratory director; L. J. Markwardt, assistant director; Parker K. Baird, Gardner H. Chidester, E. C. O. Erickson, Milburn Henig, George Mackin, John C. Pew, Sidney L. Swartz, Dr. Alfred Stamm, Rolf Thelen, T. R. C. Wilson, and Leslie A. Yolton.

A certificate was awarded posthumously to the late Dr. E. C. Sherrard, former chief of the division of derived products. Also, certificates were awarded to Dr. Horace K. Burr and Herbert R. Meyer who have resigned since the war.

◆

▶▶▶ At the summer outing of the Salesmen's Association of the Paper Industry on July 16, the Wally Wilson Memorial Trophy was won by *Charles H. Leissler*, of the Mohawk Paper Mills. This was the first golf outing of the Eastern Division this year. A second will be a joint match with the Philadelphia salesmen at Forsgate Country Club, Jamesburg, New Jersey, on September 26.

◆

▶▶▶ Election of *Donald J. Hardenbrook*, vice president of Union Bag & Paper Corporation, New York City, to the company's board of directors has been announced. The enlargement of Mr. Hardenbrook's management activities includes industrial and public relations, the company's Woodlands Division, and service departments, traffic, purchasing, legal, and accounting.

◆

T. A. LANGLIE LEAVES NAT'L STARCH PRODUCTS FOR FOREMEN'S INSTITUTE

Until recently director of personnel and industrial relations for National Starch Products, Inc., New York City, T. A. Langlie has joined the labor and industrial relations counseling division of National Foremen's Institute, Inc.

Mr. Langlie is well known in academic and industrial circles for his work in personnel and industrial relations. While connected with Wesleyan University, he advised and lectured for the Connecticut State Employment Service and State Merit System. He developed the personnel program at National Starch Products in its four plants and handled its labor negotiations with the organized unions.

As an associate of the Institute, Mr. Langlie will be available to Institute clients for consultation on matters relating to labor and industrial relations. He will divide his time between the Institute's New York office and the home at Deep River, Connecticut.

◆

JAMES d'A. CLARK NOW CONNECTED WITH PULP DIV. OF WEYERHAEUSER

As this issues goes to press, news is received that Dr. James d'A. Clark has joined the staff of the Weyerhaeuser Timber Company at Longview, Washington. The report states that Dr. Clark will be associated with

Dr. James d'A. Clark

the company's pulp division and its development department.

During the war, Dr. Clark was connected with the Quartermaster Subsistence Research and Development Laboratory in Chicago, where he conducted special research in packaging and packing.

The first of this year he was promoted from Major to Lt. Colonel, Q.M.C., and has been doing special consulting work for the Government on problems connected with fibers, pulps, papers and boards.

◆

▶▶▶ District engineers of The Dicalite Company's Buffalo and Pittsburgh offices are the appointments given to *A. L. Trumpler* and *J. T. Brady*, respectively. Before entering the Service, Mr. Trumpler worked as design engineer for the Timken Roller Bearing Company. Mr. Brady has been working out of the Dicalite office in New York since his release from the Service early this year.

◆

▶▶▶ Announcement has been made that *Robert W. Ward*, former district manager of the American Car and Foundry Company at Huntington, West Virginia, has been elected a vice president of the company. Mr. Ward will make his headquarters in New York. *W. E. Langer*, general superintendent of the Huntington plant, has been promoted to the position of district manager.

◆

▶▶▶ From The H. K. Ferguson Company, Cleveland, Ohio, comes the announcement that *Leslie C. Hughes* has been appointed consulting engineer for the chemical and process industries. Mr. Hughes formerly was with The Dorr Company, New York City, as consulting chemical engineer. His headquarters will be at the company's Cleveland offices.

◆

▶▶▶ Before the war, *Paul Torre*, sales engineer for the DeZurik Shower Company, Sartell, Minnesota, covered the Middle West and southern territory. After three years of service with the United States Army Signal Corps, Mr. Torre has returned to act as sales engineer for DeZurik in the Middle West and eastern territories.

◆

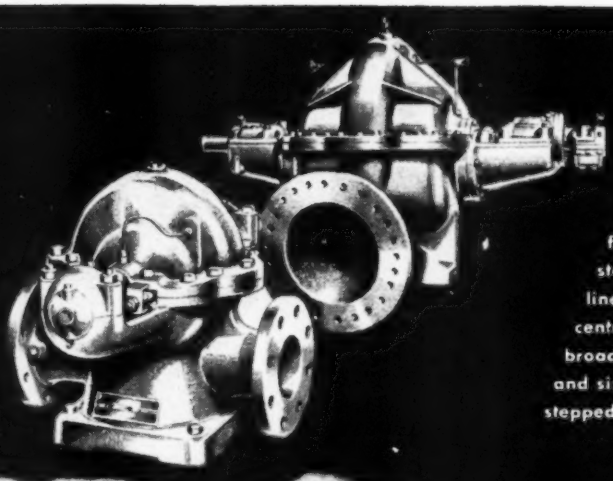
C. C. KING JOINS NEPCO SPECIAL PRODUCTS DIVISION

Latest addition to the staff of the Nekoosa-Edwards Paper Company, Port Edwards, Wisconsin, is Clifford C. King, who will aid in the development and operation of the new Nepco Special Products Division now nearing completion.

Mr. King has had 22 years of experience in waxing, coating, and laminating papers of multiple uses and in aniline and rotogravure printing. His previous connections include American Bread Wrapper Company, Wyoming Valley Paper Company, McDonald Printing Company, Package Paper Company, and the Minerva Waxed Paper Company.

◆

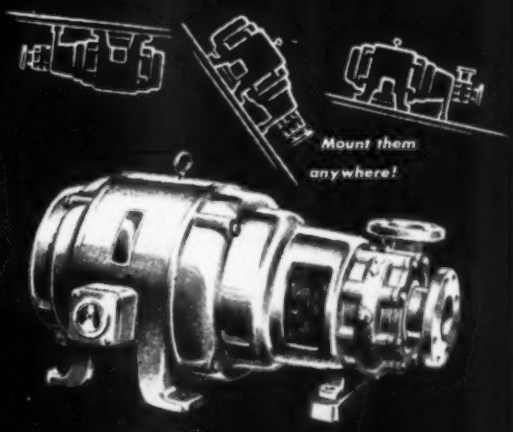
▶▶▶ The appointment of *Ralph C. Persons* to succeed Arthur S. Thompson as general manager of the Geo. H. Morrill General Printing Ink Division has been announced by Sun Chemical Corporation. Mr. Persons has been with General Printing Ink since 1944. He has served as sales manager of



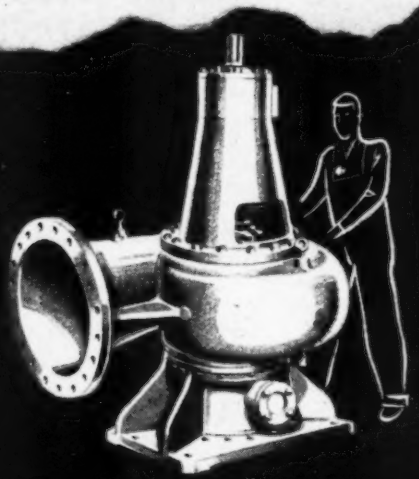
The older they are the farther they fall in attempting to meet standards that are being set by the line of Fairbanks-Morse split-case centrifugal pumps. Here's a line that's broad enough to include the type and size which most closely meets your stepped-up needs.

Time to Forget . . . and Remember!

Now is the time to forget your old pumps whose efficiency is that of a bygone era and whose daily services are costing you money! Remember—pumps are commonly designed and built to answer specific conditions of head and capacity: When these conditions change, the increase in pumping costs may be appreciable.



Replace tired-out, hard-to-get-at pumps with Fairbanks-Morse Builtogether pumps—packaged units, with pump and motor on a single shaft. Used industry-wide, they move up to 1200 gallons per minute at heads up to 260 feet.



Name your pumping job— there's a modern Fairbanks-Morse "high-efficiency" pump ready to handle it. For instance, the line of vertical Angle-Flow pumps for moving lots of water—up to 80,000 g.p.m.—at a cost that, even compared with modern standards, is extremely low.

Three famous names— Fairbanks-Morse, Pomona and Westco are gilt-edged evidence that when you see your Fairbanks-Morse dealer or call at your Fairbanks-Morse branch office, you're taking the right step toward lowest liquid-moving costs.

FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES · DIESEL ENGINES · MAGNETOS · GENERATORS · MOTORS · PUMPS
SCALES · STOKERS · RAILROAD MOTOR CARS and STANDPIPES · FARM EQUIPMENT

Morrill and general manager of Eagle Printing Ink, and is, therefore, particularly suited to head the Morrill Division.

◆

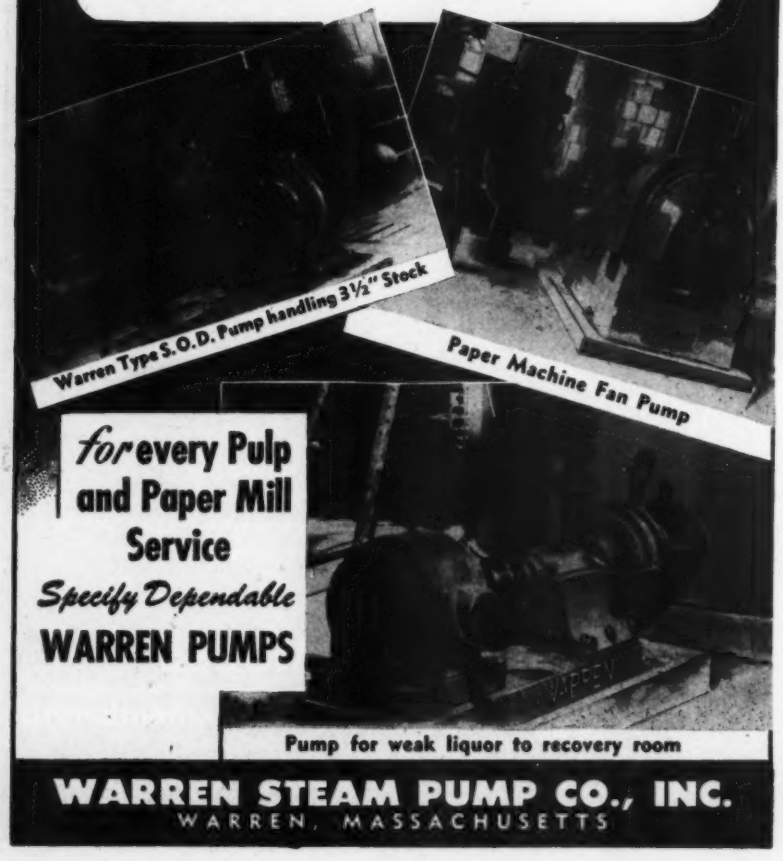
▶▶▶ The revision of one of New England and two southern sales districts, as well as the creation of four new sales posts has been announced by The Mathieson Alkali Works, New York City. *Harold R. Dinges*, who is the new district sales manager for one of the new southern districts, will be assisted by *O. J. Theobald*. Headquarters for the new district will be at Charlotte, North Carolina. *Fred O. Tilson* will direct the activities of the second new southern district from his headquarters in Chattanooga, Tennessee. *William H. Eastburn* will head the newly defined New England territory operating from Providence, Rhode Island.

◆

▶▶▶ Assistant resident mill manager of its Shelton (Wash.) plant is the new appointment given *Winston Scott* by Rayonier, Inc. Mr. Scott formerly was chief chemist and recently acting assistant manager.

FLORIDA PULP and PAPER COMPANY
Depends upon
WARREN PUMPS

for important services at their modern mill at Pensacola, Florida, which was completed in 1941 and which was designed and built to make bleached and unbleached specialty papers. Original equipment included fifty-four Warren Pumps and several others have since been added — all giving on-the-job dependability with economical operating and maintenance costs.



for every Pulp and Paper Mill Service
Specify Dependable
WARREN PUMPS

WARREN STEAM PUMP CO., INC.
WARREN, MASSACHUSETTS

NECROLOGY

ANGUS D. MACAULEY

For many years a paper-mill engineer, Angus D. Macauley passed away at his home in Springfield (Mass.) at the age of 76.

Recently, Mr. Macauley had been connected with the Phelps Publishing Company, of Springfield, holding the offices of vice president and secretary.

Born in Nova Scotia, Mr. Macauley came to this country in 1891. For many years he was an engineer with paper mills in Holyoke and Springfield. He was chief engineer for the Collins Manufacturing Company, North Wilbraham (Mass.) from 1917 to 1921. He was a member of various engineering societies. Surviving him are three sons.

◆

▶▶▶ *Chester R. Morse*, mill manager for the Wisconsin River Division of the Consolidated Water Power and Paper Company, passed away July 22. He was 42 years of age.

◆

ELLSWORTH MARSHALL RUST

One of three brothers who founded The Rust Engineering Company, Pittsburgh, in 1905, passed away July 24 at his home in Leesburg, Virginia. Ellsworth Marshall Rust had been continuously connected with the company as vice president. He was 67 years of age. The brothers also were affiliated with a number of other interests with which he was officially connected.

The Rust Engineering Company, founded and operated by E. J. Lee Rust, S. Murray Rust and Ellsworth Marshall Rust, is widely known throughout the industry. Many of the paper-making plants have been designed and constructed by Rust.

Surviving E. M. Rust are his brother, S. Murray Rust, of the firm, and a sister.

◆

▶▶▶ A salesman for the Consolidated Water Power & Paper Company, *Fred P. Sandow*, passed away suddenly at Stevens Point, Wisconsin, July 17. Mr. Sandow lived in Chicago, with headquarters at the company's sales office in that city. He was 45 years old.

◆

▶▶▶ A long-time employee of the Beloit Iron Works, *Harry Wells Parker*, passed away July 23. He was 84 years of age, and had lived in Beloit since he was two years old.

... it will if you scour felts with easy-rinsing NOPCO* Syntergent K

Scouring felts on or off paper-making machines is a tough cleaning problem and an even tougher *rinsing* problem. But these usually difficult problems are easily solved by NOPCO Syntergent K. A solution made by adding NOPCO Syntergent K to warm or cold water provides a copious and persistent lather of outstanding detergent and wetting properties and *the material itself rinses out freely and completely.*

In refreshing contrast to the difficult rinsing characteristics met with in the use of many felt-washing compounds, easy-rinsing NOPCO Syntergent K assures that no material will be picked up by the paper-sheet and carried to the Yankee drier. This is important, because such material might cause "blowing" or "bagging" as the result of surface lubrication. NOPCO Syntergent K enables the creping doctor blade to work effectively, because the sheet clings to the drier surface—until there isn't a wet spot left.

Dispersible and Stable NOPCO Syntergent K mixes readily with warm or cold water in all concentrations, forming solutions with a Ph of 9-9.5. It is wholly void of inorganic salts and possesses a 30% activity. Two percent NOPCO Syntergent K is dispersible and stable in 5% sulfuric acid and in 4% sodium hydroxide solutions. Its detergency is not impaired by these solutions, nor by other dilute acid or alkaline mediums. NOPCO Syntergent K is also compatible with soap solutions. Write for complete information.

NATIONAL OIL PRODUCTS COMPANY, Harrison, N. J.

Branches:

Boston • Chicago • Cedartown, Ga. • Richmond, Calif.

An affiliate of the American Pulp and Paper Mill Superintendents Assn.

NOPCO EVOLVED THROUGH RESEARCH

* REG. U.S. PAT. OFF.

NOPCO Syntergent K

NEW, IMPROVED FELT-SCOURING COMPOUND

AREA OF LEAK	AIR		STEAM		WATER	
Diameter Inches	Number of cubic feet per month at 75 lb. pressure	Total cost of waste per month 11c per 1000 cubic feet	Pounds wasted per month at 160 lb. pressure	Total cost of waste per month 65c per 1000 lb.	Gallons wasted per month at 60 lb. pressure	Total cost of waste per month 16c per 1000 gallons
1/2"	13,468,000	$1,481.44	1,219,280	$792.53	1,524,100	$243.86
3/8"	7,558,500	831.44	684,290	444.79	855,360	136.86
1/4"	3,366,990	370.37	304,820	198.13	381,020	60.96
1/8"	824,570	90.70	74,650	48.52	93,310	14.93
1/16"	213,000	23.43	19,280	12.53	24,110	3.86
1/32"	52,910	5.82	4,790	3.11	5,990	.96

What does it cost you each month

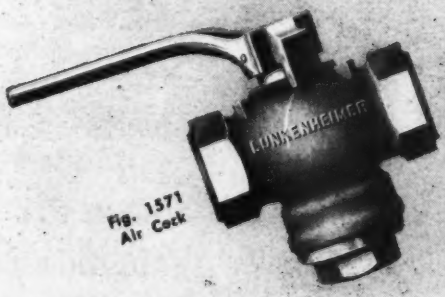
... for air, steam, water, you never use?

Maybe you've never checked the actual cost of valve leakage. If you haven't, you'll doubtless be startled at these figures.

A single valve leak the size of a pinhead can waste enough air in a month to approximate the cost of a new valve. Steam leaks . . . water leaks . . . also take a heavy toll if neglected . . . not to mention the wastage of such a critical item as fuel.

Where Lunkenheimer Valves are given ordinary care, such losses are held to an absolute minimum. These quality-built valves are designed to give extra long service with the lowest possible outlay of time, labor, and money, for maintenance.

Enlarged copies of the above chart for posting in your plant are available on request. Also available are the services of your nearby Lunkenheimer Distributor, who is fully equipped to assist in solution of your operating or maintenance problems.



ESTABLISHED 1862

THE LUNKENHEIMER CO.

"QUALITY"

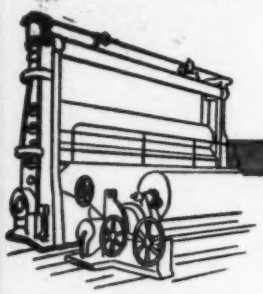
CINCINNATI 14, OHIO, U. S. A.

NEW YORK 13 CHICAGO 6
BOSTON 10 PHILADELPHIA 7

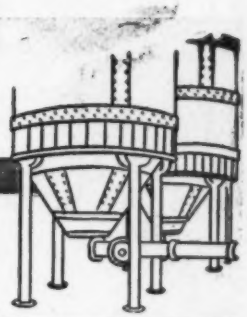
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.

LUNKENHEIMER VALVES

BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S. P.;
BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS



Practical SHORTS



Readers are invited to submit short, practical articles for this department The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Where to Place Jam Nut

Frequently two nuts are used on a bolt. Often one nut is thin and called a jam nut. Ordinarily, this jam nut is put on top, shown in Figure 1 (a), and wrenched lightly—just enough, it is expected, to lock the two nuts and keep them from loosening. Though this practice is wrong, it is seen more often than not, in spite of the fact that for thirty years textbooks on machine design have pointed out that the jam nut is misplaced when put on top. The jam nut should be the *bottom* nut and a full thickness nut should be on top and wrenched fully as shown in Figure 1 (b).

Let's see how a jam nut works. Imagine the bottom nut to be assembled and torqued only moderately, giving a pressure P on the work. Then let's put the top nut on and wrench it progressively so that its pressure against the bottom nut, P_o, increases from nothing to a maximum. Three cases arise with increasing P_o as follows:

CASE 1. P_o *less than* P—In this case the top nut has been tightened only lightly in comparison to the bottom nut. Threads of both nuts are bearing upward in the same direction on the bolt threads. If the bolt tension were lost for one reason or another, threads of both nuts lose their bearing on the bolt threads and thereafter can rattle free. Clearly there is no locking effect here.

CASE 2. P_o *equal to* P—In this case both nuts have been wrenched equally. The top nut bears on the bottom nut with the same force that the bottom nut bears on the work. P_o is equal to P and the difference in these forces, which is the load on the thread of the bottom nut, is zero. In other words, the threads of the bottom nut are not bearing on bolt threads in either direction. The bottom nut might just as well be a plain washer for all the good it does in locking.

CASE 3. P_o *greater than* P—In this case the top nut is bearing on the bottom nut with a force greater than the bottom nut bears on the work. The difference in these forces is the load supported by the threads of the bottom nut and is *downward* against the bolt threads. Since the threads of the top nut are bearing *upward* on the bolt threads, the two nuts are bearing in opposite directions on the bolt threads and, therefore, are *jammed* and locked to the bolt threads. This locking effect remains even if the bolt tension is lost. This is the only case where locking occurs and since to arrive at this condition P_o must be greater than P, it is logical that the top nut, which produces the force P_o, should be thicker than the bottom nut. Threads of the bottom nut carry only the difference in P_o and P, which is relatively small.

Another point that should be noted is that the bottom nut need not be tightened severely to produce ultimately a high tension in the bolt. As the top nut is tightened, the threads of the bottom nut first bear upward on the bolt threads (Case 1), then are free (Case 2), and finally bear downward on the bolt threads (Case 3). In this transition during Case 2, the bolt must be stretched sufficiently to reverse the thread contact. This stretching of the bolt *through* the bottom nut involves a proportionate increase in the bolt tension depending upon the looseness of thread fit of the bottom nut. The final bolt tension therefore is higher than that originally set up by the bottom nut. In fact, the tension may be higher than could be sustained by the bottom nut alone since most of the tension is now being supported by the thick top nut.

Conclusions from the above are that the bottom nut should be the thin or jam nut; also, it should not have a tight thread fit if maximum bolt tension is desired. In assembly, the thin bottom nut should be put on with only a moderate torque and the thick top nut should then be wrenched on tightly with the full torque that the bolt can stand. In order to accomplish this full wrenching of the top nut, the bottom nut should be held from turning since the frictional resistance between the nuts may then be greater than that between the bottom nut and the work. *Fasteners* Vol. 3, No. 3 (1946). AMERICAN INSTITUTE OF BOLT, NUT AND RIVET MANUFACTURERS.

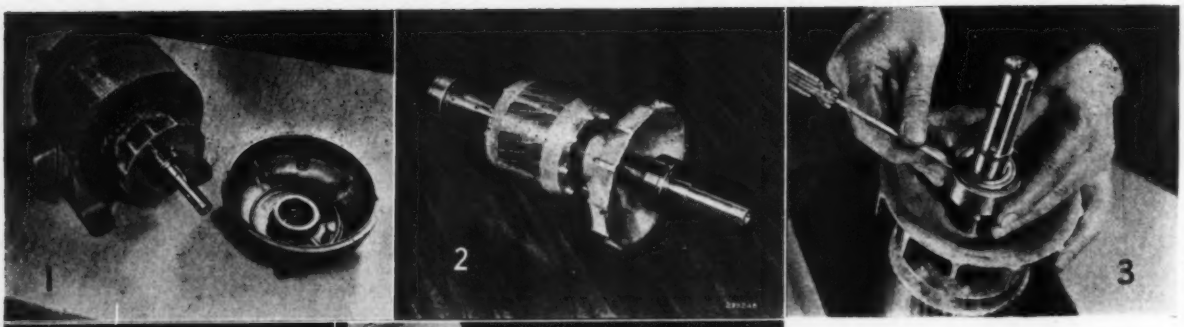
Fig. 1 (a) left—Bolt is shown with thin nut on top and thick nut is next to the plate. This is incorrect position since there is no locking action between nuts. . . . Fig. 1 (b) right—Bolt is shown with thick nut on top and thin nut on bottom. When force P_o exceeds force P, there is a locking action between the nuts

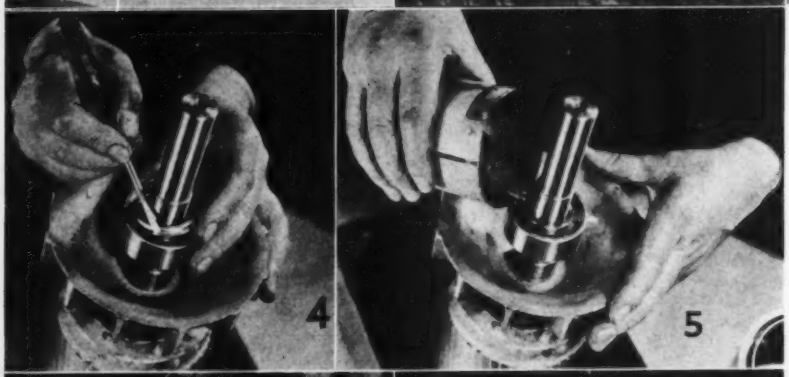
Some Fire Extinguisher Precautions

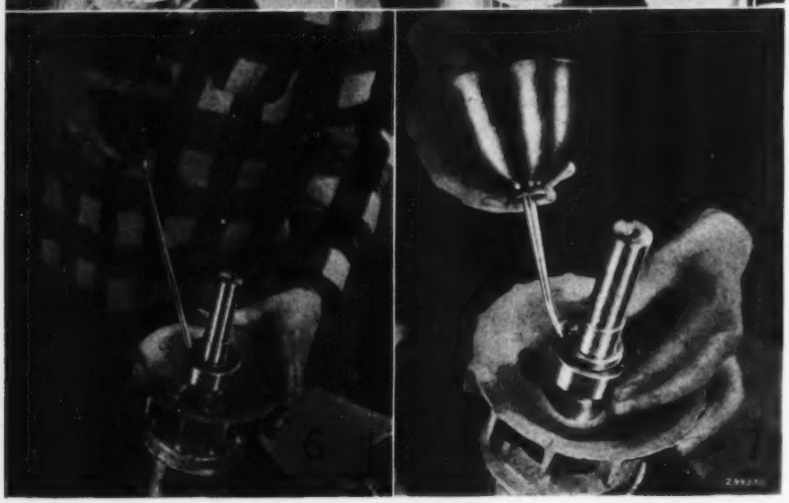
Newly acquired extinguishers supplied by sources other than the manufacturers or their authorized agents should be thoroughly inspected before they are put into service, to make sure they are in operating condition. Those that show evidence of mishandling or deterioration may be dangerous to the user and may not function properly when needed. They should be reconditioned only by the manufacturer whose nameplate they bear.

The extinguisher shell, particularly in the case of soda acid and foam types, should be examined for dents caused by falls and for signs of weakening at the seams. Bulges in the shell indicate that the unit has been subjected to freezing or insufficient venting of pressure. Evidence of soldering or other makeshift repairs are also indications that the extinguisher may not be safe for use. Soda acid and foam extinguishers should be checked on hydrostatic testing equipment for their ability to withstand pressure to 350 pounds.

Rubber hoses should be examined for cracks or loss of flexibility, especially where substandard extinguishers bearing EAS approval are concerned. Made during the war, these "Emergency Approved" models were constructed of substitute materials which are subject to rapid deterioration. Porcelain enamel coatings,







used on interior parts of EAS pump tanks and foam extinguishers, should be inspected for cracks.

Carbon dioxide extinguishers should be examined for corrosion, damage to the horn, clogging of the discharge nozzle, and damage to the valve. The extinguisher should be weighed to make sure the valve is still gastight. The cylinder should be subjected to hydrostatic test for its ability to withstand pressure to 3,000 pounds.—SAFETY RESEARCH INSTITUTE, INC.

◆

Fumes in Gas Welding or Cutting Work

1. When performing welding or cutting work on vessels or equipment which have previously contained chemicals, mercury, etc., the operator shall be extremely careful to see that they have been thoroughly cleaned prior to application of the torch. He shall also take the added precaution to see that he does not breathe the fumes resulting from the use of the torch. The use of an air line respirator provided with a continuous supply of fresh air is advisable for this type of work.

2. When welding or brazing work is performed on such materials as cadmium, zinc, lead, brass, or bronze, the operator shall be careful not to breathe the fumes caused by the flame. Special ventilating equipment or an air line respirator should be used, especially when the work is of long duration.

3. Poisonous fumes are generated by the application of heat to many of the fluxes which are now commonly used. These must not be inhaled. The operator should be supplied with fresh air by one of the methods mentioned in the previous paragraph.—*Safety for Gas Welding, Cutting, and Brazing Operators*, GENERAL ELECTRIC CO.

Prelubrication Cuts Maintenance Costs

Motor lubrication problems have been simplified with the introduction of the prelubricating bearing. In the factory, these bearings are sealed in a cartridge along with the proper amount of the correct type of lubricant. Inspection periods were first set at three years—they have now been lengthened to five. What this means in savings in manpower is obvious.

The chief advantages of the presealed bearing, aside from the sharp reduction in maintenance costs are: (1) the tightly sealed enclosure reduces oxidation of the grease, promoting longer grease life; (2) grease is kept in and dirt is kept out; (3) proper kind and amount of lubricant promotes longer bearing life; (4) when motors are disassembled the bearings are enclosed in a cartridge which protects them from dirt.

Wherever bearings turn, some need for maintenance is recognized. After motors with presealed bearings have been in operation for five years, it is recommended that a spot check be made. If the lubricant is dissolved and has an offensive odor, it should be replaced. If not, the shield of the presealed bearing may be replaced and the bearing put back in service.

When it is necessary to relubricate the bearing, the operation should be performed as follows: (1) Remove the bracket from the end of the frame, Figure 1; (2) Withdraw rotor from stator, Figure 2; (3) Place rotor on end and insert screw driver under tapered end of split spring ring and snap it out of retaining slot, Figure 3; (4) The bearing seal is now exposed. Place end of screw driver or knife under the projection provided on the seal and raise it sufficiently so that it may be grasped by thumb and index finger and removed, Figure 4; (5) Pour suitable solvent into the bearing and leave it in bearing for a few minutes to dissolve grease. Carbon tetrachloride is usually used for the removal of grease, Figure 5; (6) Be sure to blow out all grease and solvent with air. Be sure all old grease is removed, Figure 6; (7) Add a few drops of good grade of clean engine oil and spin bearing. This will prevent corrosion of bearing surfaces, Figure 7.

Add the correct amount of ball bearing grease as recommended by manufacturer. Do not over lubricate.

Replace seal and snap retainer ring in place and reassemble motor.—E. N. Fabrizio, WESTINGHOUSE ELECTRIC CORPORATION.

Things To Remember in Working With Anti-Friction Bearings

DON'TS

1. Don't work in dirty surroundings.
2. Don't use wooden mallets or work on rough or dirty bench tops.
3. Don't use dirty, brittle or chipped tools.
4. Don't handle bearings with dirty, moist hands.
5. Don't spin uncleaned bearings.
6. Don't spin any bearings with compressed air.
7. Don't use same container for cleaning and final rinsing of bearings.
8. Don't use cotton waste or dirty cloths to wipe bearings.
9. Don't expose bearings to moisture or dirt at any time.
10. Don't scratch or nick bearing surfaces.
11. Don't remove grease or oil from new bearings.
12. Don't use incorrect kind or amount of lubricant.

DO'S

1. Work with clean tools, in clean surroundings.
2. Remove all outside dirt from housing before exposing bearings.
3. Handle with clean, dry hands.
4. Treat a used bearing as carefully as a new one.
5. Use clean solvents and flushing oils.
6. Lay bearings out on clean paper.
7. Protect disassembled bearings from dirt and moisture.
8. Use clean, lint-free rags if bearings are wiped.
9. Keep bearings wrapped in oilproof paper when not in use.
10. Clean inside of housing before replacing bearings.
11. Install new bearings as removed from packages, without washing.
12. Keep bearing lubricants clean when applying and cover containers when not in use.

—ANTI-FRICTION BEARING MANUFACTURERS ASSOCIATION, INC.

◆

Clean Valves Before Installing

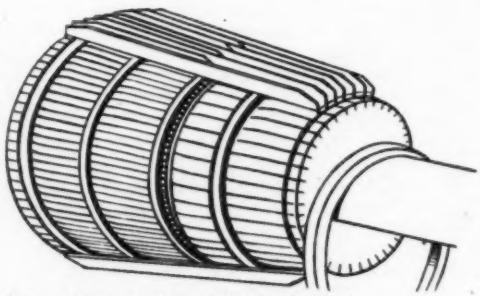
Before installation, the inside of the valves should be blown out with compressed air or flushed with water to remove all dirt and grit. Piping should be cleaned out in the same manner, or it should be swabbed to remove dirt or metal chips left from threading operations on the pipe.—THE WM. POWELL COMPANY.

On Refilling a Jordan Plug

When your jordan isn't producing as it should, even though you have the plug set in to its maximum travel and the plug woods have been chipped off clear down to the centerline of the beads on the plug bars, it's then time to put in new bars.

Here is how it is accomplished, after the plug has been removed from the shell:

1. Drive out the old woods toward the large end of the plug.

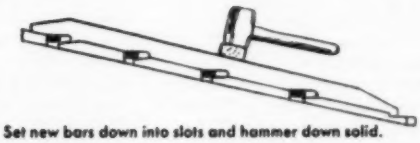


2. Remove keeper ring (the smallest diameter ring).

3. Drive the worn bars toward the small end of the plug—until the slot coincides with the rings—and lift straight out.

4. Remove all rust and scale from slots, but do not enlarge the slots.

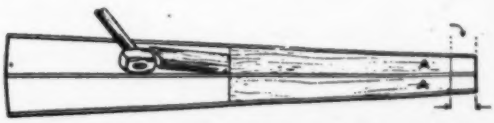
5. Apply a thin coat of oil to slots, thus helping to prevent rust and also to simplify the driving in of the new bars.



6. Set new bars down into slots and hammer down solid. Use a block between the bar and the hammer.

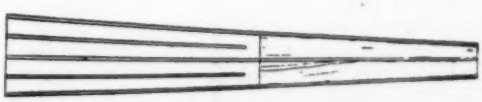
7. When bar is seated, drive toward large end until flush with keeper ring seat.

8. After long bars have all been driven into place, shrink on keeper ring, thus locking bars in position.

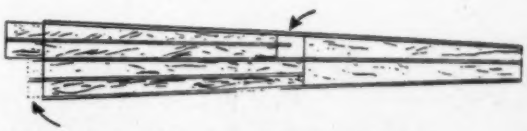


9. Fit woods into small end of plug first. Woods are fitted by planing equal amounts off both sides, by removing a little at a time and checking. Be careful not to make wood undersize.

10. Drive woods snugly up to keeper ring.



11. Reposition short bars as described in 6 and 7.



12. Drive final wood into place as in 9 and saw off excess.

13. Allow refilled plug to soak for at least 8 hours before placing in operation.

—ADAPTED FROM *The Messenger* (June, 1946)

THERMOMETRY—

*Three Hundred Fifty Years of Progress**

J. J. MORAN
Kimble Glass Company

▶▶▶ MAN SEEMS TO HAVE had methods of measuring length, volume, weight and time, since the first days of recorded history. however, there is no record of temperatures being measured until Galileo invented his thermoscope about 1595. The thermoscope was in two parts: a small bore tube with a large round bulb at one end, and an open dish for water or wine. By holding his hands on the bulb, the air inside was warmed and expanded. Then the end of the tube was immersed in the liquid in the dish. As the air cooled or was rewarmed, this liquid rose or fell in the tube.

Soon, others became intrigued with the possibility of temperature measurement of the body. One thermometer was in the form of a glass turtle, partly filled with alcohol and with a number of floating glass balls of different densities. Placed on a patient's chest, the degree of illness could be estimated by the number of balls that descended to the bottom of the turtle's body.

Sealed thermometers were first produced by members of the Florentine Academy, organized by pupils of Galileo; their experiments represented a distinct advance. The effect of change in barometric pressure on open tube thermometers was recognized. They realized that thermometers must have some fixed point, so zero was designated as the point where the column of liquid halted when the thermometer was placed in a cool cellar.

Apparently, Renaldini in 1694, was one of the first to propose two fixed points, and the first to select the melting point of ice and the boiling point of water. These two points are still used as the fundamental fixed points in thermometry.

Until Fahrenheit introduced mercury as a thermometric liquid in 1714, water, wine and alcohol were the usual liquids. His zero was the temperature of a mixture of ice, water and salt, 32 that of a mixture of ice and water, and 96 the normal temperature of the human body. On this scale, the boiling point of water was 212, although he did not take this as a reference point.

Celsius divided the interval between the boiling and freezing points of water into 100 parts, designating the freezing point by 100 and the boiling point by zero. Shortly thereafter, others suggested that the numbers be reversed and from this came the centigrade scale. The work of Celsius may be said to end the first phase in the development of thermometers. In this phase, no account was taken of the variation in boiling point of water with pressure, the disadvantages of using a liquid which wets glass, particularly if the liquid in question is viscous, the sluggishness of thermometers provided with large bulbs, or the need of tubing of uniform bore.

The second phase of theremometer development is intimately tied up with the investigation of the laws governing the behavior of true gases which resulted in the formulation of the thermo-dynamic scale by Lord Kelvin in 1847. Since then, work has been directed mostly towards refinement of the scale, together with means for measuring fixed points throughout the range.

As presently defined, "the Thermo-Dynamic Centigrade Scale on which the temperature of melting ice and the temperature of condensing water vapor, both under the pressure of one standard atmosphere, are numbered zero degrees and 100 degrees respectively, is the fundamental scale to which all temperature measurements should ultimately be referable." (Burgess, George K., *Bur. Stds. J. Res.*, 1, 1928.)

Knowing the departures of certain properties of the more permanent gases from a perfect gas, it is possible to construct gas thermometers with accurate scales. However, they are impractical in general laboratory and industrial work. It is necessary, therefore, to construct temperature indicating devices of suitable materials, the indications of which can be referred to the standard scale of temperature.

For the range —25° C. to +100° C., the International Bureau of Weights and Measures did this some 50 years ago when mercury-in-glass thermometers, calibrated very carefully by comparison with a hydrogen gas thermometer, were made available. When it became necessary to extend this limited International Hydrogen Scale to higher and lower temperatures, certain fixed points defined by freezing or boiling points of certain pure substances were given values corresponding to points on the scale of a gas thermometer. This was done separately by various national standardizing bodies and some discrepancies were introduced.

In 1927, an International Conference was held and a practical scale defined. This is called the International Temperature Scale and is based upon a number of fixed and reproducible equilibrium temperatures, to which numerical values are assigned, and upon the indications of interpolation instruments calibrated according to a specified procedure at the fixed temperatures. All liquid-in-glass thermometers now are referred to this International Temperature Scale, defined throughout the range —182.97° C. to 660° C. in terms of the resistance of a standard platinum resistance thermometer.

The usual liquid-in-glass thermometer consists of a bulb and stem sealed together. While it is possible to make thermometers having the bulb blown out of the stem glass, the "set-on" bulb is more uniform in wall thickness and diameter. Moreover, stem and bulb must meet different requirements. The basic composition of the stem must be such that it can be colored readily and etched easily, while the important property in the bulb glass is minimum permanent volume change with time or conditions of use. The two glasses, of course, must be capable of being sealed together.

For use above 400° C., a special borosilicate glass must be used, and stem and bulb are made from the same piece of tubing.

Mention should be made here of etched-stem and enclosed glass scale thermometers. In the former the outside of the stem is about 6 to 7 mm., and the scale is engraved on this stem. The stem of the second type is about 3 mm. in diameter, and the scale is engraved on a flat white piece of glass and both stem and scale are enclosed in an outer glass envelope, sealed to the top of the bulb. While more care must be taken in reading the engraved stem thermometer to avoid errors of parallax due to the greater distance from scale to mercury, it is preferred in this country. An exception is thermometers designed to float in a liquid.

For temperatures between —40° C. and 600° C., mercury is the preferred indicating liquid, because of its regular expansion, high boiling point and non-wetting property. An alloy of mercury and thallium recently has been used for temperatures down to —70° C. Liquid pentane is useful if temperatures to —100° C. are to be measured. Alcohol and other organic liquids frequently are used in thermometers at ordinary temperatures, but high precision is very difficult to obtain with any liquid which wets glass.

The bore of the stem of a thermometer may vary from 0.10 mm. to 0.50 mm. depending on the range, volume of bulb, etc., and on the liquid used for indicator. Cross-section of the bore may be circular or oval, the advantage of the latter being to make the liquid column appear wider. Usually this tubing has a white stripe background to make the mercury more easily visible. Recently, other colors have been used—yellow, orange, red, etc.

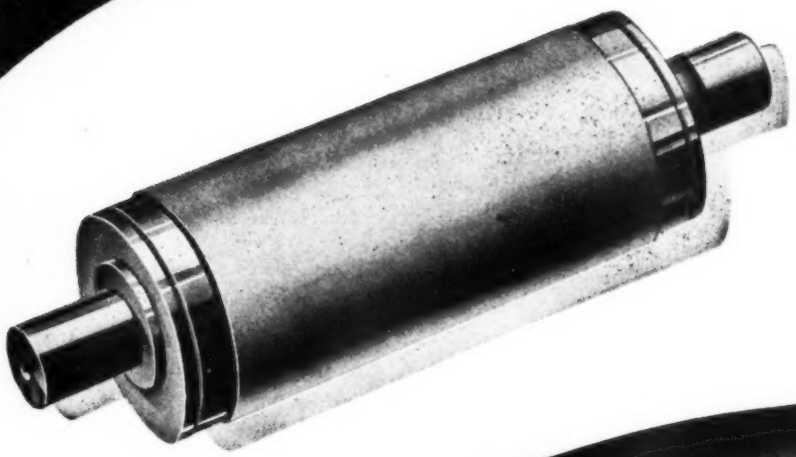
When the stem tubing is received from the maker, it must be sorted according to the bore. The simplest method is to measure the rise of alcohol in the tube when the end is immersed. The bore can also be measured by a microscope having a ruled reticule, or it can be projected on a screen. The most accurate method is the oldest; measurement of the length of a short thread of mercury as it is moved along the tube.

The proper bore to use for a thermometer is calculated from the size of the bulb, the length of scale and the tem-

*Reprinted from The Burrell Technical Announcer.

PERKINS RESEARCH

keeps pace with INDUSTRIAL PROGRESS



PERKINS

CALENDER ROLLS

B. F. PERKINS & SONS, INC.

HOLYOKE · MASSACHUSETTS

Specializing, too, Lindsay has made Fourdrinier wire cloth ever since 1903.

Packing and shipping at Lindsay are probably more critical operations than the customer imagines. Every employee in these departments, old and new alike, is instructed minutely in the proper handling of Fourdrinier wire cloth. This is just one of many "required subjects" in a factory-wide training course.

THE LINDSAY WIRE WEAVING COMPANY
14001-14299 Aspinwall Avenue · Cleveland 10, Ohio

Lindsay **WIRES**

Why experiment in tank construction when this proved, practical and dependable type of construction is now available?

The material that is enduring, clean and adaptable to any size or shape.

Consult Kalamazoo engineers for planning any type of tank or chest.

KALAMAZOO TANK & SILO COMPANY
KALAMAZOO MICHIGAN

perature range of the scale, taking into account the differential expansion of liquid and glass. Having selected the proper stem tubing, it is sealed to the bulb tube which is then bottomed off to the desired length.

Thorough annealing is next—not only to relieve strains set up by the sealing and bottoming operations, but to prevent changes in the bulb volume in the finished thermometer. The bulbs of poorly annealed thermometers may contract enough to cause an apparent rise in temperature of 20° C. or 35° Fahr.

Next, the blank is filled. Vacuum systems are in general use. The blank is exhausted, and then the open end submerged in the liquid which is subject to atmospheric pressure.

With mercury thermometers for temperatures above 150° C. an inert gas, usually nitrogen, is next introduced under pressure to fill the space above the mercury and then the upper end is sealed shut. If a ring is to be provided, it is put on at this point. The gas prevents separation of the mercury column in handling and also prevents vaporization from the surface of the mercury at high temperatures, since the increase in pressure due to contraction of the gas increases the boiling point of the mercury.

The original pressure of the gas must be controlled, for too high an initial pressure will cause the bulb to expand too much when heated, resulting in minus errors in reading. Too great a pressure may cause fracture of the thermometer.

The conditions of use of some thermometers are such that there may be a possibility of heating above the highest temperature on the scale. Increase of pressure if the entire interior became filled with liquid, or if the gas above the liquid were compressed too much, might cause the thermometer to explode. To prevent this, an expansion chamber is provided above the top graduation line.

With other thermometers, the lowest scale division may be set considerably above room temperature, so that the mercury level could easily be down in the bulb at ordinary temperatures. This is undesirable, because gas may be trapped in the bulb when thermometer is heated. To prevent this, a contraction chamber is provided for this type of thermometer between the bulb and first graduation.

In order to set the machine which inscribes the scale, reference marks along the stem of the thermometer corresponding to the needed setting points, must be provided. To secure these marks, the blank is brought successively to the various temperatures selected as reference points by immersion in an appropriate medium together with a standard, which may be a platinum resistance thermometer or another glass thermometer. Any corrections which apply to the standard are taken into account. The stem of the blank is marked at the points to which the mercury rises.

Temporary changes occur in the volume of a thermometer bulb when it is heated. For example, if a thermometer is heated to 80° C., it will read about 0.06° lower at 20° C. than if it had not been heated. In calibrating, it is customary to begin at the lowest temperature and work up. The same procedure should be followed in use, namely, measure the lowest temperature to be determined first. These temporary changes disappear almost completely in a few days.

To secure the ice-point (0° C.) a bath consisting of shaved ice and distilled water is provided. Between 0° C. and 95° C., a well-stirred electrically heated water bath is used, while from 95° C. up to about 400° C., oil baths are suitable. To reach temperatures above 400° C., an electrically heated metal block having a number of holes of suitable size for thermometers is used.

Thermometers may be calibrated so that the entire liquid column is immersed or the thermometer may be immersed to a definite depth, say 76 mm. In this latter case some of the mercury column may extend above the bath and be subject to heating or cooling by the ambient air. For partial immersion thermometers, ASTM specifications give definite average temperatures of the emergent stem to be used in standardizing. These temperatures have been determined carefully under actual conditions which prevail when these thermometers are used in ASTM Methods of Test.

Having located the reference points, the calibrated blank is coated with wax and the appropriate scale and numbers

SO FAR—AND NO FARTHER

Penetration of printing ink oils and waxes can be perfectly controlled by KELGIN, the modern algin surface sizing agent. It provides a smooth, dense surface and guarantees bright, clear color values . . . insures a faultless printing surface for gloss ink printing.

KELGIN does not cause foaming—picking—sticking to the rolls. It is perfectly suited to waterbox application in the calender stacks . . . is soluble in both hot and cold water. KELGIN is quickly, easily applied—and it is surprisingly inexpensive.

KELGIN is a product of Nature, processed under rigid specifications to produce a consistently uniform result. It will fit your most exacting formula requirements. Our Technical Staff will gladly assist you in your surface sizing problems. Just drop us a line.

KELCO COMPANY

20 N. Wacker Drive, CHICAGO-6 | 31 Nassau Street, NEW YORK-5 | 530 W. Sixth Street, LOS ANGELES-14

Cable Address: KELCOALGIN—New York

cut in the wax, exposing the glass at these places. The machine for the lines is a special form of dividing engine designed particularly for the type of scale needed on thermometers. For the numbers, machines similar to a jeweler's engraving machine having a master plate and a pantograph reduction are in general use.

When lines and numbers have been placed in this manner, the waxed tubes are dipped in approximately 60 per cent hydrofluoric acid which etches the exposed portions. The time required varies, depending on the strength of the acid, and type of glass.

After removal of the wax, the etched portions are filled with an opaque filler in order to increase the visibility. All good thermometers are then recalibrated to insure that no error has crept in during the lining and numbering operations.

The German Pulp and Paper Industry*

▶▶▶ THE GERMAN pulp and paper industry was found in general to have been less advanced than the same industry elsewhere. In many branches of the industry normal German technology was, in fact, backward. It was only in the development of technologies for certain normally submarginal fields to meet wartime expedients or in the use of pulp and paper products as substitutes for critical materials that the German industry had shown any recent developments. Such fields and uses included bleached beech sulphite pulp for cellulose nitrate; special purified wood pulps as a substitute for cotton for other cellulose derivatives; yeast grown on sugars in sulphite waste liquid; evaporating and burning sulphite waste liquor to avoid stream pollution; sulphite spin paper for binder twine as a substitute for sulphate paper and sisal; hardwood from fiberized wood wastes for use in house construction; and a relatively small number of pulp and paper products as substitutes for critical materials like asbestos, rags and glass. Paper products as such apparently did not play an outstanding part in the war outside of their important conventional uses. Except possibly for the yeast and hard fiberboard, the products developed were for the most part found to be inferior to normal products or the processes by which they were made to be uneconomical in peacetime conditions, especially for application in America.

New pulp and paper mill installations since 1938 in the area visited, which included two beech pulp mills, several hard fiberboard mills, two paper machines, and a number of auxiliary pieces of equipment, were found to be of high quality and modern design, but conventional. The Finkh pulp screen was believed to be the most important equipment development proven by use. Normal development and installation of equipment were undoubtedly curtailed by the limited amount of materials of construction allotted to the paper industry. Nevertheless, a few new designs in equipment, such as the Shongau jet-barker, the Scheufelen filter, and the Brecht-Darmstadt stock inlet, were in process of development, although not proved.

Institutional and mill research was found to be directed mainly toward improving the quality of pulp and paper products, toward better utilization of these products, and toward finding substitutes for wood fibers themselves. The development of protective papers, for example, had received considerable attention, but this field was not believed to be very advanced.

Because of the minimum of new developments found in the German pulp and paper industry, a considerable portion of the investigation was devoted to finding out the manufacturing procedures actually employed in the various branches of the industry. These procedures differ in many respects from those used in America and it was believed that an exposition of them would be helpful to the American industry. The highlights observed in the different phases of the German pulp and paper industry were as follows:

Sulphite Pulping

Sulphite pulping practices were considerably less advanced in the mills visited than in most American mills. Wood barking was generally done by wasteful, knife-barking methods, although a few drum barkers were said to be used and a jet barker was under development. Chipping was done with old-style 3- or 4-knife chippers. The pulping was done by time-honored procedures with application of none of the more recent developments like the hot-acid system or the use of high pressure and strong acid. The digestion cycles were very long and abnormally low outputs were realized per digester. The pulp was universally discharged from the digesters by washing. Cooking control was entirely by hand. Except for minor changes in the temperature schedule for increase uniformity of pulping, the usual procedures for producing a soft pulp were applied to beech for ultimate usage as a chemical pulp. The use of the Finkh screen for both coarse and fine pulp screening was perhaps the most outstanding equipment application. The quality of sulphite pulp produced in Germany was understood not to have been exceptional.

Bleaching Sulphite Pulp

Modern pulp bleaching procedures were used in only a relatively few mills, and the average level was below that elsewhere. The use of sodium hypochlorite in the final bleaching stage of pulps for chemical purposes was common. The quality of unpurified bleached beech sulphite pulp was apparently adequate for nitrating. A shortcoming of the pulp for use in viscose manufacture was its high fraction of short fibers, although its low resin content was a desirable characteristic.

Purified (High Alpha) Pulps

Purified wood pulps made by conventional purification methods or by the wartime developments of sulphate pulping preceded by hydrolysis of the wood and of nitric acid pulping apparently served as satisfactory substitutes for cotton for the manufacture of cellulose derivatives. The successful uses of nitric acid pulp for cellulose acetate and of the prehydrolyzed pulp in high strength rayon tire cords and cigarette paper were of particular interest, although neither pulping process is new in principle. It is doubtful, however, if either process could be operated successfully in an American economy.

Sulphite Waste Liquor Utilization

Utilization of the sugars in sulphite waste for alcohol production has been practiced in all German mills since World War I, although the economics are understood to be unfavorable. The development of the technology for yeast production when required by the use of beech is an important advancement in recent years, and this industry may possibly survive under normal conditions. Further, the technology developed may find some application in American mills. The utilization of by-products from the evaporated liquor was on the same limited scale as before the war and no new uses have been developed. The evaporation and burning of sulphite waste liquor to prevent stream pollution received certain technological advances, but the problems were not all solved and the economics are very unfavorable.

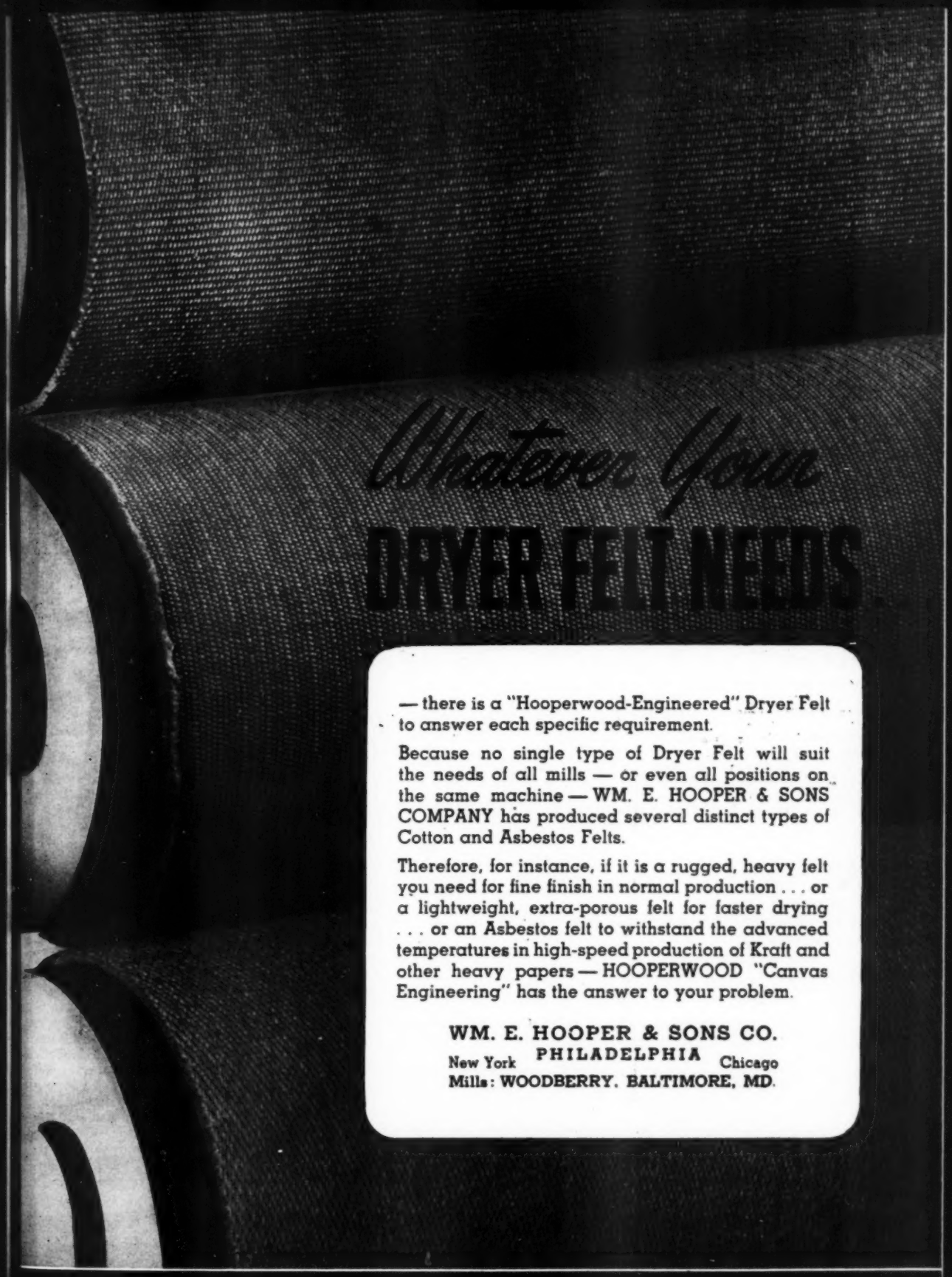
Kraft Pulping and Bleaching

This industry is of minor importance in Germany and is conducted along older conventional lines. The product was regarded as only average. The prehydrolysis development is discussed under "Purified Pulps."

Groundwood Pulping And Brightening

This industry is apparently still conducted under the same relatively low temperature conditions which have characterized it for years. There was considerable interest in developing a high strength groundwood pulp in order to benefit from the high yield advantage of this process, but the development was not believed to have been put on a commercial basis. Steamed groundwood for use on boards has long been made in substantial quantities in Germany.

*From Summary of Investigators Reports on Technical Industrial Forest Products Developments in Germany (Issued February, 1946, United States Department of Agriculture, Forest Service, Forest Products Laboratory, Madison, Wisconsin, covering reports on investigation for the Forest Products JIOA (Joint Intelligence Objectives Agency) Subcommittee. Date of trip, March 14, 1945 to December 1, 1945.



— there is a "Hooperwood-Engineered" Dryer Felt to answer each specific requirement.

Because no single type of Dryer Felt will suit the needs of all mills — or even all positions on the same machine — WM. E. HOOPER & SONS COMPANY has produced several distinct types of Cotton and Asbestos Felts.

Therefore, for instance, if it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an Asbestos felt to withstand the advanced temperatures in high-speed production of Kraft and other heavy papers — HOOPERWOOD "Canvas Engineering" has the answer to your problem.

WM. E. HOOPER & SONS CO.

New York **PHILADELPHIA** Chicago

Mills: WOODBERRY, BALTIMORE, MD.

HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS

Paper and Paperboard

Except for the manufacture of newsprint paper on a few modern, high-speed news machines (not seen), German papermaking in the mills visited was characterized by low outputs on old, slow-speed machines with a minimum of control and regulating equipment. Beater processing of the pulp was used to a large extent and the skill of the operators played a very important part in producing the high grade specialty papers for which a few German mills had a considerable reputation. Although certain papers like crepe paper for nitrating, spin paper, and certain protective papers were developed during the war period, there did not appear to be an extensive application of paper for wartime uses.

Hard Fiberboard

The manufacture of a hardboard similar to Masonite (but believed inferior in quality) from defibrated wood was understood to have been a wartime development. Several small, well-designed and well-equipped mills were erected since 1938 to produce a board for construction, reputedly from wood waste. This development may possibly find application in America if the product can compete on a quality basis with similar boards now on the market and the process is proven to be economical.

Special Paper Products

Protective papers with wet-strength or impervious qualities had apparently aroused considerable interest, but they were found to be used relatively little and they were still in the initial developmental stage. The need for protective papers for packaging was very small in Germany in comparison with that in the United States. Waterproof papers were mostly conventional, although special treatments were reported, but not verified. Binder twine of an acceptable quality from sulphite paper was developed and used. The paper laminated plastic field was devoted entirely to the production of electrical insulation materials according to long-known methods.

Research

A certain amount of research was done to find substitute fibers for wood fibers and to make wood fibers stretch further, but no great application resulted as far as could be determined. Practical research was apparently conducted to a considerable extent to meet immediate needs, but no outstanding pieces of work were found.

Convention Papers . . . Abridged

Abridgments in this section are from papers presented at the annual meeting of The American Pulp and Paper Mill Superintendents Association, held in Poland Spring, Maine, June 17-20, 1946.

The Benefits of the Board Machine Air System

WILLIAM K. METCALFE
J. O. Ross Engineering Corp.

There is not a board mill in the country that is not using air. No matter what grade or type of board produced by mills, every one of those mills is using large quantities of air.

Obviously no hard or fast rules can be set up for every mill. Each mill is a problem in itself and each superintendent operates his mill a little differently than anyone else. Yet from records of board mills over a period of the last ten years, it is possible to give a fair average formula for calculating the air required. From this formula, you can check your own particular setup and see how it compares with the average. This formula gives in cubic feet per minute the volume you should exhaust:

$$TK = V$$

Where:

T = Production of machine per day in tons

V = Volume in CFM

K = The constant varying from 1100 to 1500 for northern mills and in the neighborhood of 2000 for southern mills

In addition, it is necessary to know the amount of air to return to the mill. This can be obtained from another simple formula:

$$V = S$$

Where:

S = Supply volume in CFM

k = Constant, usually .8 or .85.

It is obvious from the first formula that northern board mills require 1100 to 1500 cfm per daily ton of board produced, and the southern mills around 2000 cfm per daily ton of production. The reason for approximately 35 per cent additional air for southern machine is the lower moisture carrying quality of the air passed through the mill.

It can also be seen that either 80 per cent or 85 per cent of the air exhausted should be returned to the mill from outdoors by mechanical means.

The 15 per cent to 20 per cent to balance the exhaust comes from leakage at cracks, windows, doors, etc. This inleakage helps to keep the operators happy since they expect it to be cooler around doors and windows. Furthermore, without upsetting room conditions, there is no horsepower expended to handle this portion of the return air. In winter, when the mill is tightly closed, additional resistance is added to the exhaust fans and a smaller quantity of air is handled through the mill. This is not detrimental, however, since the outside conditions compensate for the smaller quantity of air handled, inasmuch as there is less moisture in the incoming outside air.

The only cases where air is 100 per cent balanced, or even at times 10 to 15 per cent excess supply is furnished, is where it is necessary to keep out the dust and dirt from a very fuzzy paper, such as perhaps bottle cap, high grade lamp shades, etc.

The above exhaust formula applies where the machine is properly hooded. Properly hooded implies wide overhang and deep curtains. A machine having no hood may be considered to require 20 to 25 per cent more air handled through the mill to give comparable results. With this in mind, the dollars and cents value of the hood can readily be calculated as follows:

$$Vf = A$$

Where:

V = The volume calculated in the previous formula

f = A factor varying from .12 to .16

A = The amount in dollars saved in a 300 day year at a steam cost of 50c per 1000 lbs.

In addition to the steam saving, an asbestos hood benefits board mills by the following:

(1) Better working conditions and more efficient workmen

(2) Lower temperatures required

(3) Allows the mill to remain warm longer after shutdowns

(4) Keeps foreign material from falling on the felt or sheet

(5) Reduces deterioration by confining the vapors

(6) Asbestos and steel construction is fireproof, waterproof

(7) Improved appearance of machine room due to the paneled, white asbestos board construction

There are two ways open for treating exhaust; it can be either thrown direct to the atmosphere or the heat content can be partially reclaimed. Exhaust straight to the atmosphere needs no explanation.

There are three common methods of reclaiming heat from exhaust vapors:

(1) Fresh air heating

(2) White water heating

(3) Fresh water heating

Any one, or any combination of two, or all three can be introduced into the Air System. When they are used separately, the savings for each individual unit is highest.

By means of a Briner Economizer, it is possible to reclaim heat by increasing the temperature of the incoming air as it passes through the interchanger.

The successful heating of white water is a rather recent development. Until the application of the Ross Scrubber was tried, there was no good way to avoid the trouble of nozzles clogging or equipment clogging, and white water heating was usually omitted from the Air System.

The white water recovery unit is installed first in the series of recovery units. Unless the white water is delivered at 70 Fahr., or below, it is not generally recommended.

Fresh water heating is as old as the art of heat recovery from exhaust vapors. However, it has not been until recently that a revival of interest has been shown, and today almost all Economizer installations incorporate fresh water heating as well.

THE
CONCAVE SIDE
A
GATES
PATENT
V-Belt in Sheave
Clearly, it's the sides of a V-Belt that do all the gripping on the pulley and get all the wear against the sheave-groove wall. That's why longer life for the sides means longer life for the belt!

That's Where V-Belts Get All the WEAR!

—and that's WHY the CONCAVE SIDE is *IMPORTANT!**

Examine a hundred—or a thousand—worn-out V-Belts and here is what you will find—

> *Almost without exception,* it is the sidewall of the belt that has worn out *first.* There is a perfectly natural reason for this—and every man who works around machinery knows it.

It is the *sidewall* of a V-Belt that has to *grip* the pulley and *drive* it. It's the sidewall that *transmits* to the pulley all the power the pulley ever receives. No other part of the belt gets anything like the *actual* wear the sidewall gets. Is it any wonder the sidewall of the *ordinary* V-Belt is the part that wears out first? And when you prolong the life of the sidewall you naturally prolong the life of the belt!

The simple diagrams on the right show clearly why the ordinary, *straight-sided* V-Belt gets *excessive* wear along the *middle* of the *sides.* They show also why the Patented Concave Side *greatly reduces* sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight sided V-Belts can *possibly* give.

Straight Sided V-Belt

FIG. 1

How Straight Sided V-Belt Bulges When Bending Around Its Pulley

FIG. 1A

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall

FIG. 2

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley

FIG. 2A

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

*More Important NOW Than Ever Before.

Now that Gates Specialized Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important today than ever before!

THE GATES RUBBER COMPANY
DENVER, U. S. A.
World's Largest Makers of V-Belts

Gates

THE MARK OF SPECIALIZED RESEARCH

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks **IN ALL INDUSTRIAL CENTERS** of the U. S. and 71 Foreign Countries

For *ALL* your KNIFE GRINDING
The HANCHETT GK

The GK Knife Grinder will handle all your knives and shear blades with ease—turns them out with an absolutely straight and smooth edge, the first time!

If knife grinding is a problem in your plant, consider these features. Completely automatic—no skilled operator necessary. Simple design . . . for minimum maintenance. All feed works grouped in a single unit, mounted in front . . . for easy, quick inspection. All moving parts run in a constant oil bath.

USE AN ACME KNIFE BAR FOR QUICK CHANGE-OVERS

If you have a quantity of thick and thin knives, install an Acme Knife Bar on your GK. The Acme handles both types equally well, without loss of time—just turn the knife bar over.

Operators report savings of 40% and more in knife steel, after installing GK's. Why not write the pioneers in the field today, and see how your knife maintenance costs can be cut? No obligation, of course. And ask for complete details—Bulletin 846-PW.

(Below) The GK Knife Grinder is available with Hydraulic Drive, as shown here, or with Mechanical table traverse.

ELECTRIC BRAZERS
ANVIL STAND HAMMERS
BAND WHEEL GRINDERS
MISCELLANEOUS SAWS
KNIFE FITTING EQUIPMENT

HANCHETT MANUFACTURING CO.
SAW AND KNIFE FITTING MACHINE DIVISION
BIG RAPIDS, MICHIGAN U.S.A.

SAW SHARPENERS
SAW STRETCHERS
KNIFE GRINDERS
SWAGES AND SHAPERS
WELDING CLAMPS

It is found that the water gives longer life to the Economizer sheets and increases the efficiency by keeping a clean surface. The spray water reduces any possible fire hazard, and the additional cost of the equipment is minor.

The customary procedure is to install spray nozzles over and below the Economizer sections, although, where very clean water is desired, such as for boiler make-up, the water can be circulated through serpentine coils and not come in contact with the vapors. The temperature rise obtained by the water is less in the latter case.

Board mills may install all four economy units, or any combination of two or more, depending on the local circumstances. When a hood, white water heating, economizer and fresh water heating system is installed, naturally the individual unit return is reduced with the possible exception of the white water.

The installation of a hood will save 20 to 25 per cent on the steam required for a mill obtaining similar results without a properly designed hood.

By installing a white water system, approximately 20 per cent of the heat added as the air passes through the mill, can be reclaimed.

By installing a Briner Economizer System, approximately 20 per cent of the head added can be recovered, and by installing fresh water heating system, approximately 30 per cent of the heat can be reclaimed.

Add them together, you have no need of a steam plant.

Unfortunateiy, it is only possible to reclaim a total of about 60 per cent of the heat added by the mill with all four units combined in one system.

So far, we have dealt only with the exhaust side of the air picture. Now let's consider supply.

A supply system will do the most good when properly applied to the dryer section. The supply systems which furnish air to the dryer section are commonly known as Vapor Absorption, Dryjector, Grewin, and Felt Supply. Then there are a series of systems not connected with the machine, such as Heating and Ventilating, Summer Ventilation, and Air Makeup.

The Vapor Absorption System is the workhorse of the board machine total air system. It is practically universally installed on board machines and is adaptable to machines having two deck, three deck, or stack arrangement. The quantity of return air that can be supplied through a Vapor Absorption System is dependent on the diameter of the dryers and the dryer arrangement. In general, as much air is supplied as possible in line with keeping the system from becoming an obstruction in the efficient operation of the machine.

The advantages of a Vapor Absorption System may be listed as follows:

(1) Increased machine production. The installation of this system will account for at least 15 per cent increased tonnage, and it is not uncommon to revamp older systems and obtain 10 per cent increased production.

(2) A reduction of back pressure can be realized, equivalent to and in lieu of the increased production. Where a quality sheet is desired, and it is necessary to operate at a lower back pressure, the production need not decrease if a Vapor Absorption System is installed.

(3) More uniform dried sheet across the width

(4) Reduction, or elimination of blisters or cockles

(5) It is easier to approach the air dried

(6) Lower drying temperatures

(7) Both sides of the sheet the same dryness

(8) Improved working conditions

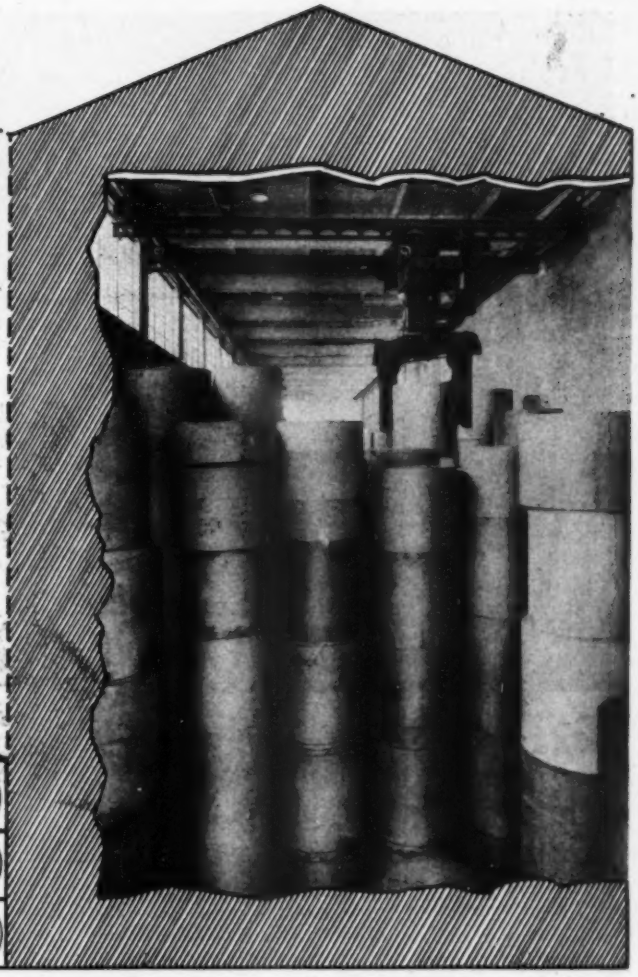
Some board machines are equipped with a bottom felt. In these cases a combination Vapor Absorption and Injection System (known as the Dryjector System) is installed. The machine is equipped with cross nozzles along the top row of dryers, and is furnished with injection type Dryjector nozzles in the bottom pockets.

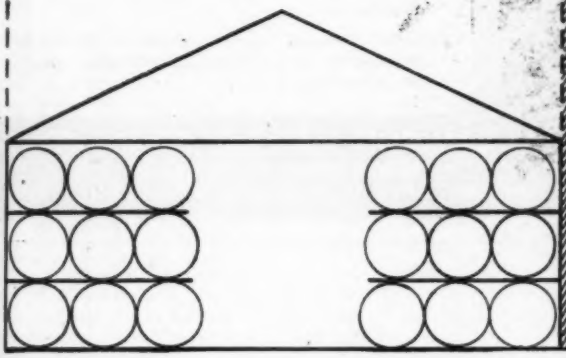
When the Dryjector System is installed in conjunction with a bottom felt system, an increase in production can be realized that is comparable to the Vapor Absorption System.

The same benefits outlined for the Vapor Absorption System would apply to this system.

RAISE THE ROOF

IF ROLL STORAGE IS A PROBLEM





COSTS 25% LESS THAN INCREASING FLOOR SPACE

If you have a roll storage building with low ceiling, extra capacity can be obtained at far less cost by raising the roof than increasing the floor area. The difference is cost usually runs 25 per cent and more — a sizeable saving.

But this is not the only saving. With high head room and a Cleveland Tramrail roll-handling system, the rolls can be stored vertically to heights of 42 feet and greater, and the entire floor area utilized. No aisles are needed. All handling of rolls is done overhead by only one man in the Tramrail cab. Rolls are handled at a fraction of former costs by this method.

Paper spoilage is often a costly factor which is reduced tremendously by the Cleveland Tramrail system. In some mills this alone amounts to a saving of 1% of all paper handled.

Now is the time to make studies of roll storage and handling methods. Why not see what Cleveland Tramrail can do for you? No obligation of course.

GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1165 East 283rd Street • Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

HINE 18

Engineered by Specialists for Fast, Precision Winding

CAMACHINE 18 is largely used as the winding unit of paper machines and operates smoothly at speeds up to 2,000 F.P.M. in widths from 73" to 162"

In board mills and paper mills **CAMACHINE 18** will give good service either directly behind the paper or board machine or as a rewinder in the finishing room. When handling board it will run smoothly at speeds up to 1,200 F.P.M.

CAMACHINE 18 will keep ahead of the fastest paper or board machine. At whatever speed it may operate it produces perfect rolls with cleancut edges and uniform density from core to circumference. Among its features are automatic counterweighting of riding roller to insure uniform density throughout entire diameter, drum grooving to prevent wrinkles, easy threading, etc.

Simple in design and construction, **CAMACHINES** are noted for their dependability in daily operation year in and year out.

GET FACTS! WRITE FOR THIS FOLDER

CAMERON MACHINE COMPANY
61 POPLAR STREET, BROOKLYN 2, N. Y.
MIDWEST OFFICE: 111 W. MONROE ST., CHICAGO 3, ILL.

The Grewin System handles a very small quantity of air at a very high pressure; is small in size, taking up very little space in the machine room, and causes practically no interference with the operation of the machine. The advantages of this system are:

(1) Increased production, amounting to at least 10 per cent

(2) The equivalent reduction in back pressure, if desired

(3) Increased felt life

(4) More uniform drying across the width of the sheet

(5) It is possible to increase the moisture content in the finished product, due to the even condition of drying

(6) Low operating costs of the system

The bottom felt supply system consists of furnishing a volume of air either by means of a series of cross nozzles on the wider machines, or a perforated plenum chamber on the narrow machines under 80 inches in width.

The benefits of this board machine air system are as follows:

(1) Increased drying capacity of from 5 per cent to 10 per cent

(2) It affords a blanket of air around both sides of the dryer nest which acts as an insulator for the cooler room air coming into the hood and affords an excellent quality of air to be induced by the Dryjector or Grewin nozzle

(3) It will prolong the life of the bottom dryer felt; in fact, it will frequently double the life

(4) Permits a more evenly dried sheet across the width

(5) A reduction in back pressure can be obtained

The Heating and Ventilating System is designed to keep the roof dry and a greater or smaller amount of return air may be used. If a small amount is used at an increased temperature, it is equivalent to a larger volume of air at a lower temperature.

The distribution system of the Heating and Ventilating System is important, and unless it is properly designed so as to agitate the air bordering the underside of the roof structure, local conditions will develop where the temperature is below the dewpoint and condensation will result. A system of duct work supplying the air into the pockets formed by the roof construction, or in a machine room having very deep trusses, special diffusing heads directing the air at the roof area will serve the purpose nicely.

In addition to keeping the roof dry, the Heating and Ventilating System will also reduce deterioration of apparatus and equipment.

The working conditions are improved in a mill equipped with a Heating and Ventilating System.

Summer ventilation is receiving considerable attention in these days of labor disputes and where every effort is made to improve working conditions. The summer ventilation system handles a small quantity of outside air and concentrates it in a space perhaps 15 ft. in diameter close to the operating areas; in other words, perhaps two or three outlets would be installed at the wet end of the machine; one or two in the dryer section, particularly if the machine is equipped with a breaker stack and size press, and perhaps three additional outlets at the dry end where the men are working.

In some of the mills, particularly the larger mills, we find that we still need to supply additional air after we have utilized all of the return air in the systems outlined above. When this is the case, air makeup units are installed.

The air makeup unit is a specially designed large volume air heater capable of handling outside air and tempering it sufficiently to keep from upsetting the room conditions. It is particularly useful in mills having a mezzanine floor built adjacent to the back side of the hood curtains. If it is a long machine and the back aisle is rather narrow, the center of the machine at the back is lacking adequate air to balance the air that is coming in along the front side of the hood. One or more makeup units supplying air under the mezzanine will relieve this condition.

In addition to the above air handling units, there is a whole host of auxiliary systems for the board machine, such as calender cooling; trim conveying; locker ventilation; grinder exhaust system; motor cooling; cylinder mold foam elimination; cutter tape suction system; dust and felt hair removal systems; and in fact, any job around the mill that can be accomplished by means of air.

From pulp to paper... via all-CRANE Piping

There's no limit in pulp and paper making on applying the increased efficiency and reduced cost advantages that result from standardization of piping equipment.

That's the experience of mills who depend on the Crane line for every piping need, and who by so doing, get this exclusive 3-way advantage—

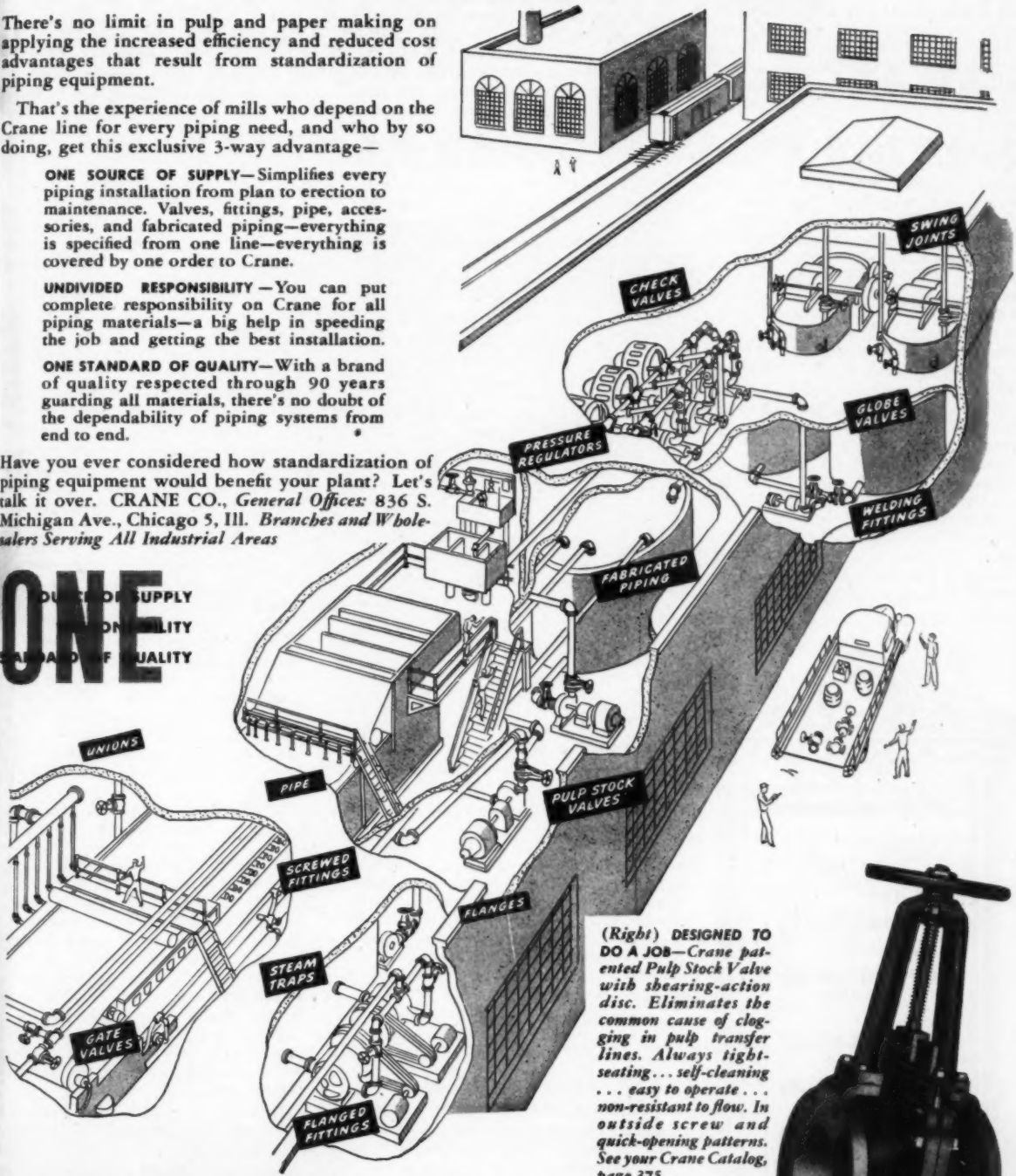
ONE SOURCE OF SUPPLY—Simplifies every piping installation from plan to erection to maintenance. Valves, fittings, pipe, accessories, and fabricated piping—everything is specified from one line—everything is covered by one order to Crane.

UNDIVIDED RESPONSIBILITY—You can put complete responsibility on Crane for all piping materials—a big help in speeding the job and getting the best installation.

ONE STANDARD OF QUALITY—With a brand of quality respected through 90 years guarding all materials, there's no doubt of the dependability of piping systems from end to end.

Have you ever considered how standardization of piping equipment would benefit your plant? Let's talk it over. CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Ill. *Branches and Wholesalers Serving All Industrial Areas*

ONE



(Right) **DESIGNED TO DO A JOB**—*Crane patented Pulp Stock Valve with shearing-action disc. Eliminates the common cause of clogging in pulp transfer lines. Always tight-seating... self-cleaning ... easy to operate ... non-resistant to flow. In outside screw and quick-opening patterns. See your Crane Catalog, page 375.*

EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
HEATING • PUMPS

CRANE

FOR EVERY PIPING SYSTEM

Molded Fiber Articles

M. P. CHAPLIN
Chaplin Corporation

The manufacture of molded fiber products has to do with that branch of the pulp and paper industry where individual articles are formed, dried, and sometimes finished as individual pieces in contradistinction to the making up of a sheet of paper or board on a paper machine and of then converting these sheets into shaped articles.

It represents but a small part of the paper industry, particularly so far as tonnage is concerned. It is rather highly specialized; and being highly specialized, it is not too well understood by the industry; perhaps it is generally misunderstood.

The manufacture of molded products, largely by hand or by simple machines, came along with the other developments in the industry, and in some cases, I think we might say actually preceded them. For instance, we might say that the hand sheet or the handmade paper is a form of pulp molding. At least, this hand idea was carried forward in the making of not only flat sheets, but of shaped articles, for some thirty-odd years during the early stages of progress in this art.

Most of these early articles found limited use, and being manufactured largely on hand machines, were rather costly. One of the earliest developments which found commercial favor and which resulted in substantial production, was the manufacture of fiber pails and tubs. One of the largest companies manufacturing these products was located in Maine. The machines were semiautomatic and reasonably efficient. The methods employed dies of a shape which would make the article which was wanted, and either the article was molded on an open die and subsequently compressed either between two dies, or between one die and a rubber bag with water or air pressure on the outside, or else the article was molded between two dies, which dies served to compress most of the water from the pulp mass and left the article sufficiently rigid and strong so that it could be handled. The remaining water was removed from the article by oven drying, after which the article was impregnated and further dried. This impregnation was to render it waterproof and add to its strength and rigidity and also to improve the appearance and surface characteristics. After completion, impregnation and drying, handles were attached.

The development of rustproof metals in the form of tin and galvanized iron made it possible to produce pails and tubs considerably cheaper than was possible by the fiber-molding process. They were also more durable. The fiber article, while reasonably strong, would chip and break whereas the metal article might dent or bend, but would still be usable. This is one example of the competition between materials and this particular fiber product has long since yielded to metal and passed out of existence.

This development was carried forward in somewhat modified form in the manufacture of tubes and closed containers in the form of barrels. In the barrel process, the article was formed on the inside of a separable or bipart mold either by pressure on the inside, or by vacuum on the outside, or by both. The dilute pulp materials were introduced into the mold and violently agitated while pressure and vacuum were applied thereby creating a deposit of fiber on the inside of the mold, and after the deposit had been formed, heated gases were usually introduced into the mold to partially dry the article on the die before the die was opened and the article removed therefrom. Foreign manufacturers, particularly Germans, carried this development considerably farther than did we in the States, and included not only the manufacture of half barrels and full barrels, but also many other types of closed containers.

A considerable quantity of smaller articles were made a good many years ago by this closed mold process, among them being milk bottles. A substantial quantity of these were made in Maine. Originally developed in the Middle West, these articles seemed to find favor more in the two extremes of the country, in Maine and in California.

Articles formed by this process are rather porous and rough on the inside as no practical method was developed for smoothing the inside. Rubber bags and various smoothing devices were tried to some extent, but ordinarily the inside of these articles was rather rough and required coating with paraffin or some other protective material before the article could be used. This not only added to the expense but detracted from the appearance of the article, and while used to quite a little extent for a few years, this article fell into disfavor for sanitary and other reasons. Its cost was rather high.

This process was also used to some extent in the manufacture of molded toys in the form of doll's heads, etc. At Christmas time, you may recall seeing in the department stores miniature reindeer or miniature Santa Clauses, usually filled with candy. These found favor for only a comparatively few years. They were fairly expensive as considerable hand labor was involved in their manufacture and few, if any, of these articles are manufactured today.

The closed mold process has more recently been utilized in the manufacture of clock cases and small cabinets. Molding machines have been made more automatic and costs thereby reduced. Most, if not all, of these articles, however, require additional finishing, spray coating, or other work in order to make them suitable for their intended use.

Most of the developments which I have discussed took place some forty, fifty, or even sixty years ago, but it is something around forty years ago that two products and machines for their manufacture were developed, which products have increased steadily in popularity and in quantity manufactured and sold. These are the simple molded pie plate and the egg flat for packing eggs in thirty-dozen cases.

In the case of the pie plate, fiber scored a very substantial victory over metal, thereby redeeming itself for its defeat in the competition over tubs and pails. Before the advent of the fiber plate, pies were necessarily sold on the metal plates in which they were baked. As the metal plates were fairly expensive, they had to be returned to the bakery for re-use. But even if they were returned, this handling was rather expensive and quite inconvenient.

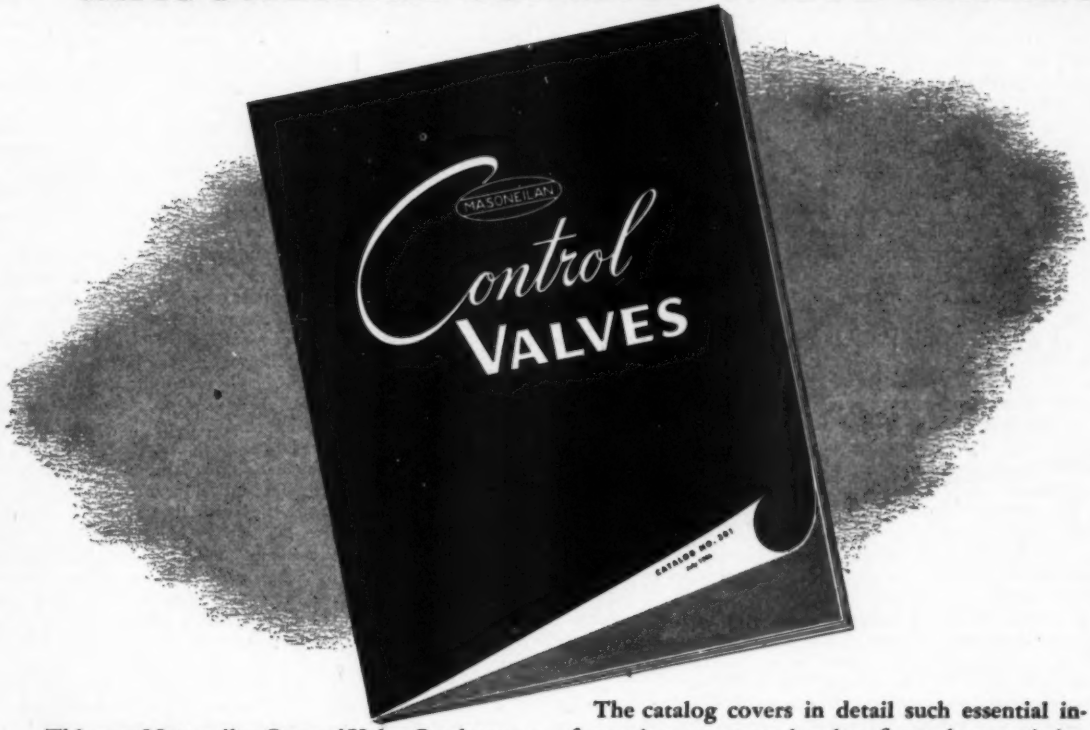
Initially, plates were made of board and stamped or pressed into the approximate shape of the metal pie plate. However, this plate was not too satisfactory because when the hot, moist pie was placed on the pressed board plate, this article had a tendency to flatten out and failing to hold the pie in shape, would break the crust and not only hurt the appearance of the pie, but also, in the case of juicy pies, the broken crust would allow the filling to run out and down over the edge.

Efforts and attempts to use stiffening agents in the fiber either before or during the pressing operation proved rather expensive and not too satisfactory.

However, the molded plate, being formed to the same shape as the tin plate, would not flatten out and found almost instant favor with the bakeries in the handling and shipment of pies. The pies were baked in the metal plates as before and as soon as partially cooled, were transferred to the molded fiber plates and then delivered to the consumer. More recent developments have produced a molded fiber plate in which pie can be baked eliminating the use of the metal plate. In this case they were made both waterproof and greaseproof.

Announcing . . .

THE NEW MASONEILAN CONTROL VALVE CATALOG



This new Masoneilan Control Valve Catalog contains complete factual information and covers every phase of control valve selection including C_v . . . Valve Flow Coefficient . . . which is a basic means for comparing flow capacities and characteristics.

The catalog covers in detail such essential information as control valve flow characteristics, flow coefficient and flow curves, materials and construction, selection of types, handwheels, dimensions, weights and other specification data. Write for your copy of this important catalog today.

MASON-NEILAN REGULATOR COMPANY

1196 ADAMS STREET MASONEILAN BOSTON 24, MASS.

Main Office: Boston 24, Mass.

MASON-NEILAN REGULATOR COMPANY
1196 Adams St., Boston 24, Mass.

Gentlemen: Please send me your new CONTROL VALVE CATALOG.

Name.....

Position.....

Firm.....

Address.....

City..... *State*.....

Pie plates were made absorbent so that if there was any surplus grease or moisture on the bottom crust of the pie, the plate would absorb it, thereby rendering the crust more dry and flaky.

In addition to the pie plate being used for the handling of pies, it also came to be used as a picnic or luncheon plate, particularly for outdoor use. The demand for this increased to a point where specially shaped molded plates were developed, these corresponding more to the shape of the ordinary table plate and made reasonably waterproof and grease resistant so that they would hold foods without becoming soft.

The use of molded plates for household use particularly, and also for restaurants, was limited somewhat by their rough appearance which resulted in the development of smooth finish plates and other products which, being smooth on the inside, gave a more pleasing appearance in the serving of food.

The molded table plates and picnic plates encountered more competition with the pressed board plate than was the case with the pie plates. Notwithstanding this competition, the molded picnic and table plate industry has developed to a point where it nearly equals the ordinary pie plate use.

Along with the development of the pie plate, there was also another product known as the butter dish, or lard tray. This was an oval shaped container made in some five or six sizes and designed for use in delivering lard or delicatessen products to the consumer from a bulk container. Although these were in direct competition with the folded or stapled board lard tray usually made from wax-lined board, these articles found very substantial favor and are still being manufactured and sold in substantial quantities.

In the case of egg packing materials, it had been customary to pack eggs in the thirty-dozen cases by using strawboard materials, both as a separator between the layers of eggs and also as fillers or cellular structures which divided each section of the case into the three-dozen egg compartments. The filler, or cellular structure, is used much as it has been, but the strawboard or other flat board separator between layers has been almost entirely replaced by a molded structure which provides cushions under each egg, thereby supporting the egg over a larger area and eliminating a tremendous amount of breakage.

The popularity of the molded egg flat in the packing of bulk eggs, but which still required the use of the cellular separator, resulted in the development of several types of articles which would still pack eggs in bulk in the thirty-dozen case, but would eliminate the board separator. It also promoted or helped to promote the individual molded pulp carton for a dozen eggs, which is now being manufactured in substantial quantities.

As is characteristic in most industries, the development in recent years has been more rapid than in the early years and very much more has been accomplished and many more new articles brought out in the last twenty years than in the twenty years preceding. New articles developed primarily for war uses have accelerated development, and while probably not more than one in five of these new articles will find commercial use in substantial quantities in the near future. still the war development has given an impetus to development in the molded field.

The initial process in the manufacture of a molded article is similar to that employed in the manufacture of a flat sheet of paper or board in that these articles are formed of a dilute mixture of fibers and water of about the same consistency as used on a paper and board machine, the dies being covered with wire, the same as used on a Fourdrinier or cylinder machine.

In pulp molding, suction usually is used throughout the formation process and in substantially greater degree than ordinarily employed in paper or board machines. The character of the die mounting on the machine itself usually permits and encourages higher vacuum which delivers a drier sheet or article, eliminating drying time and cost.

After the article has been formed on a die, it is removed from this die, sometimes being further compressed by a second die, and delivered to an oven for drying. Its drying, however, presents a number of additional problems over and above drying a sheet or web of material in that each individual article must be carried through the dryer or oven rather than being carried along over rolls as a continuous sheet.

In certain cases articles are delivered to an ordinary belt conveyor, but if they are rather intricate in shape and have a tendency to sag out of shape due to their weight during drying, they may be wholly or partially supported on forms as they are carried through the dryer and this helps to retain their shape and prevent or eliminate warpage.

Practically all articles having a rough finish are dried by one of these two methods or some combination of them, after which they are sorted and packed for shipment.

In the case of the smooth finish articles, however, these are usually dried between two dies, one or both of which are heated. In this case drying can be much more rapid and the article can be dried in a matter of seconds as compared with minutes in the case of oven drying.

Generally speaking, production equipment for molded fiber articles is developed to meet the conditions of manufacture of some particular article, or according to the ideas of the manufacturer who is going to use the machine.

The preparation of pulp material for molding is much the same as would be done for paper or board. A great many articles are made from groundwood pulp and wastepaper, groundwood pulp being almost universally employed in the manufacture of pie plates and certain classes of picnic plates, and wastepaper almost universally employed in the manufacture of egg flats and egg cartons. Aside from the pumps and other equipment for delivering the prepared pulp materials to the machine, the only other auxiliary equipment required is the vacuum and water extraction pumps for formation, a small quantity of compressed air, some means of supplying heat for drying, and sometimes printing equipment for finished products.

Assuming that a sales survey has indicated that there is a demand for an improved or new product, the first logical step is to design the product employing various materials and from this design, to select one which has produced the best product at the least cost. Molded products effect pulp material savings in the form of cutting waste, and normally provide a more rigid article than those which are made up from box board or other sheet material. The end use of the product will usually determine whether it can be rough-finish, unprinted, or whether printing is

This is an OWEN PULPWOOD GRAPPLE •

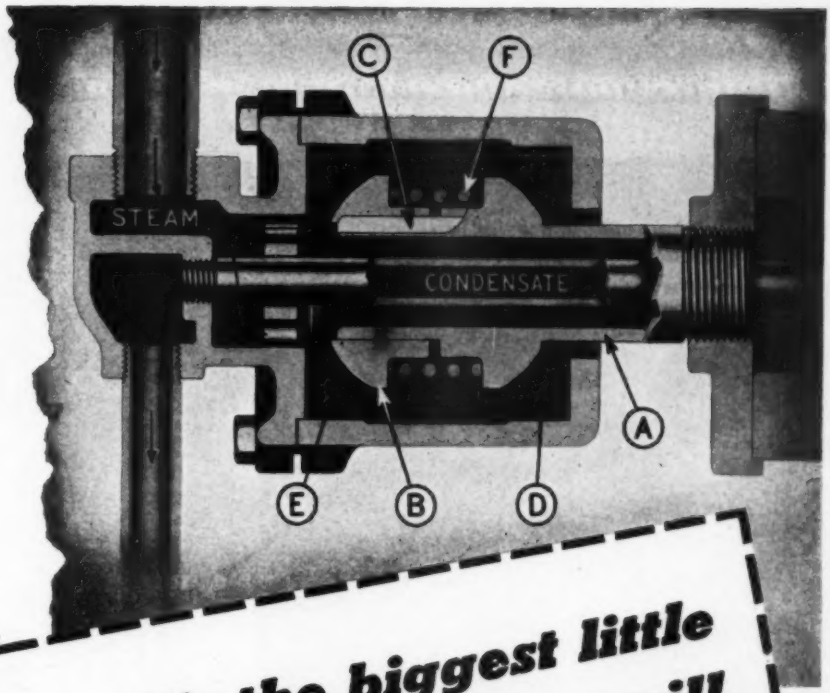
To handle a *greater volume* of pulpwood in *less time* and at a *reduced cost,* some of the world's largest Pulp and Paper Mills have installed the Owen Grapple System.

Wouldn't it be wise to think in terms of your pulpwood handling problems today, in order that you may operate the more profitable "Owen Way" tomorrow?

Write for illustrated bulletin.

The OWEN BUCKET Co. BRANCHES: New York, Philadelphia, Chicago, Berkeley, Calif.

6015 BREAKWATER AVE., CLEVELAND, OHIO



Nipple (A) is connected to roll or drum. Sliding collar (B) is keyed to nipple at (C), but slides loosely over it so pressure can fill entire housing. This pressure becomes the sealing force, by pressing seal ring (D) tightly against nipple. Both seal ring and bearing ring (E) are of special carbon-graphite, which eliminates oiling and packing. Spring (F) is for initial seating only. Type B Joint illustrated; other types, sizes for all needs.

....it's the biggest little trouble-saver in the mill

In terms of physical size alone, the Johnson Joint could hardly be called big machinery. But in its ability to save time and trouble, and promote plant efficiency, its stature approaches anything the industry has ever seen.

The Johnson Joint was designed to go after the old stuffing box and steam fit troubles in a business-like way, and it literally knocks the stuffing out of them. There's no packing of any kind. There's no oiling required, ever. There's no adjusting — the higher the pressure, the tighter the seal. There's little to fear from misalignment — with provision for both lateral and angular movement built right in. Note besides how neatly it provides for more efficient syphon drainage, through the same head that admits the steam.

In dollars and cents, what does all this add up to? Well . . . enough at least to pay the cost of switching over to Johnson Joints in just a short while. Enough certainly to make the Johnson Joint too big to overlook.

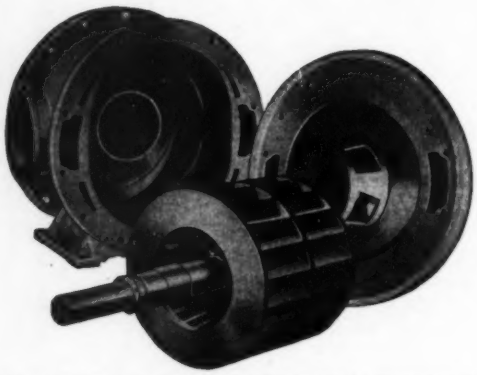
Write for literature and the name of your nearby Johnson representative.

JOHNSON
Rotary Pressure
JOINTS

THE JOHNSON CORPORATION
845 WOOD STREET, THREE RIVERS, MICHIGAN

Every time you see "Bond Paper" the chances are more than even that it was made with ASTEN DRYER FELTS
ASTEN-HILL MFG. CO., PHILADELPHIA
ASTEN-HILL LTD., VALLEYFIELD, QUE

SIMPLICITY



NASH VACUUM PUMPS HAVE ONE MOVING PART

Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

necessary, or perhaps a smooth-finish product would be the only one which would satisfactorily answer the customer's requirements

Here, probable quantities required over a period of years will have a bearing on whether or not it will justify the die cost for a molded product or whether or not a lesser cost for converting equipment with perhaps not as good an article is the logical and economic answer.

Most of the products produced by fiber molding processes are of the single use type and therefore, must be furnished the consumer at a low enough cost so that he can afford to buy them in quantity and throw them away after being used once or deliver them with another product, as in the case of the pie plate and other food containers.

Packing materials, however, are frequently used over and over and their re-use depends a great deal on the comparative cost of new articles and the cost of returning the used articles to the point of re-use. Even so, their re-use is limited and many packers prefer to use new materials even though used materials might be available at somewhat less cost.

Passing from the field of consumer goods to durable or semi-durable goods, we have, strangely enough, a revival of the tub and pail idea of fifty or sixty years ago and the employment of pulp molding processes in the manufacture of fibre plastic products. Present-day methods employing thermo-setting materials, either by impregnation or incorporated with pulp materials as formed, permit the manufacture of many new and useful molded items in the durable group and which are more likely to survive competition with metals and other materials than were the pails and tubs of fifty years ago.

This and many other developments in this field indicate its wide adaptability and its continued growth through the years has indicated that it is a stable and important part of the pulp and paper industry as a whole.

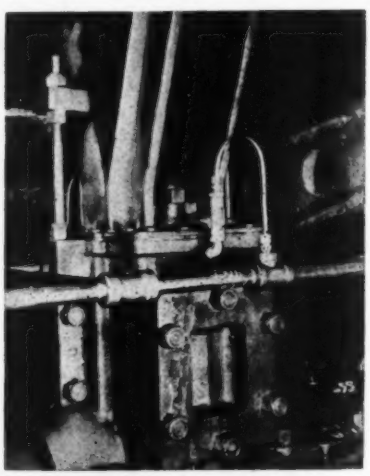
New Thoughts on Drives, Vats And Screens for Board Machines

ALLEN A. LOWE
Sales Promotion Manager
The Sandy Hill Iron & Brass Works

To begin with, the drive. Paper machine operation has progressed in speed only as the drive of the machine has been improved.

The first paper machines were short and ran at slow speeds because they were operated with parallel belt drives without cone pulleys.

A great step in advance came when in 1870 Mr. Marshall introduced the old Marshall train. It provided for change of draw by cone pulleys, maintenance of relation of speeds of sections by the line shaft and the necessary change in direction of rotation were provided by the mortise gear and cast iron or steel pinion. Paper machines up to 1000 feet of paper speed per minute have been operated by

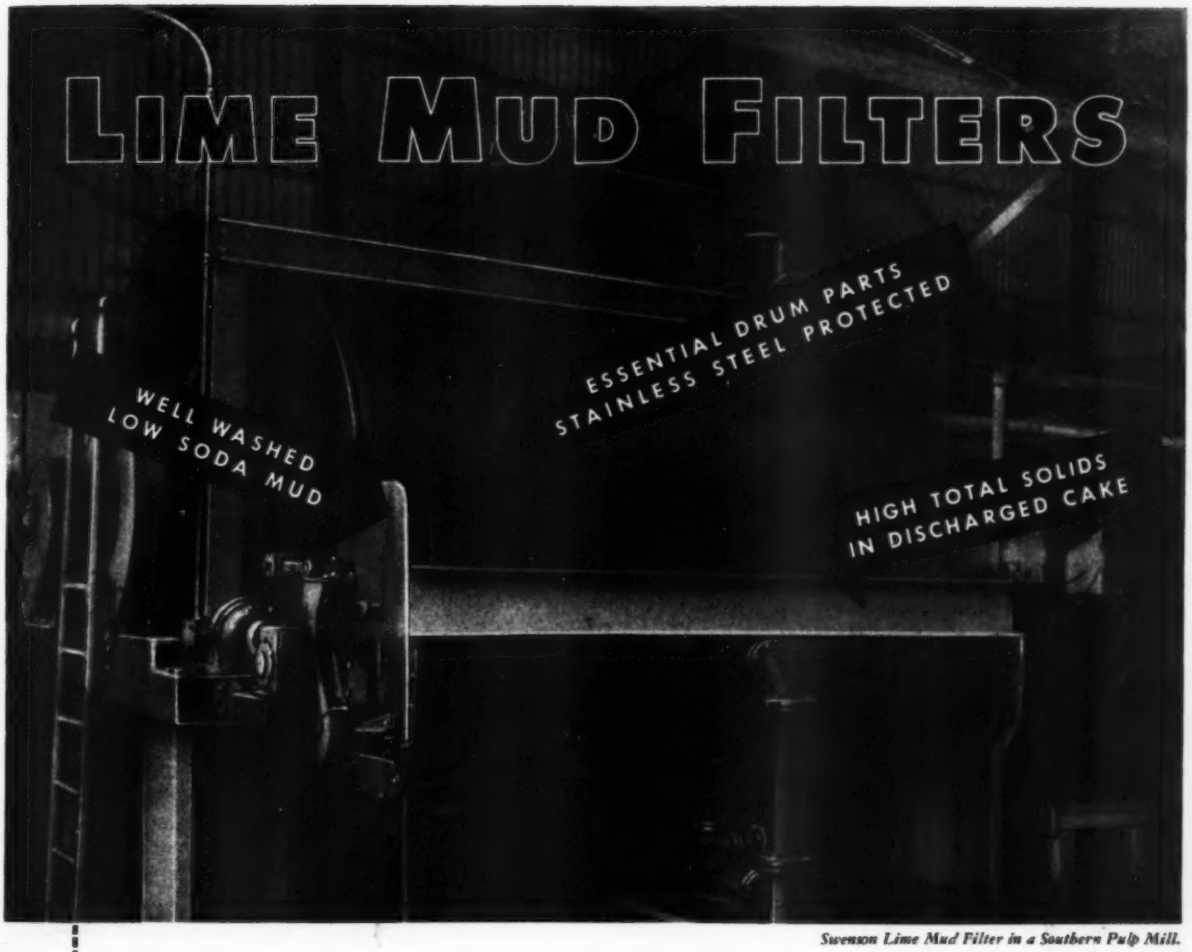


New design roller shoe unit for screens

such a device but not many and not for long.

Speed is not the only improvement sought by the papermaker. Efficiency in power transmission, increased range and control of draw, economy of maintenance and lubrication, and economy of space were improvements sought by fine paper mills whose rate of formation was restricted and, of course, by board machine operators.

Solutions to these problems are offered by Sandy Hill. Now the Sandy Hill Iron



Swenson Lime Mud Filter in a Southern Pulp Mill.

THE SUCCESSFUL performance of Swenson Lime Mud Filters has permitted pulp mills to reduce operating costs by its ability to provide a well washed mud, low in soda content, with high total solids in the discharged cake. This has resulted in better kiln operation and lower kiln fuel consumption.

This filter has been specifically designed for lime mud operation, and is almost completely automatic—requiring very little attention. Its sturdy stainless steel protected construction combined with low speeds results in low maintenance cost. All parts are readily accessible for inspection or repair. Fully described in Bulletin F-100—write for a copy.

Write for
Descriptive Bulletin F-100

SWENSON
SWENSON EVAPORATOR COMPANY
Division of Whiting Corporation
15653 Lathrop Avenue, Harvey, Ill.
Export Dept.: 30 Church St.
New York 7, N. Y.

PULP WASHERS • BLACK LIQUOR EVAPORATORS • LIME SLUDGE FILTERS • BLOW CONDENSERS

& Brass Works offers a drive which goes a step further. Incorporating the variable pitch V-belt in the drive to take the place of the cone pulleys, the space requirement is brought pretty nearly to an irreducible minimum.

It is no longer necessary to occupy valuable space in a basement or set a line shaft on an expensive structure of steel. The prime mover and the line shaft may now be placed on the machine room floor.

The combination of V-belt drive with antifriction bearings and hypoid gears running in oil makes a combination which would have amazed Mr. Marshall as much as his train pleased the paper-makers of his time.

An advantage of the Sandy Hill drive is that understanding of all its parts and their replacement and adjustment is within the scope of the usual competent millwright present in every paper mill.

Another important bottleneck in board machine operation is the vat. This, of course, means the formation of a satisfactory sheet at increased speeds.

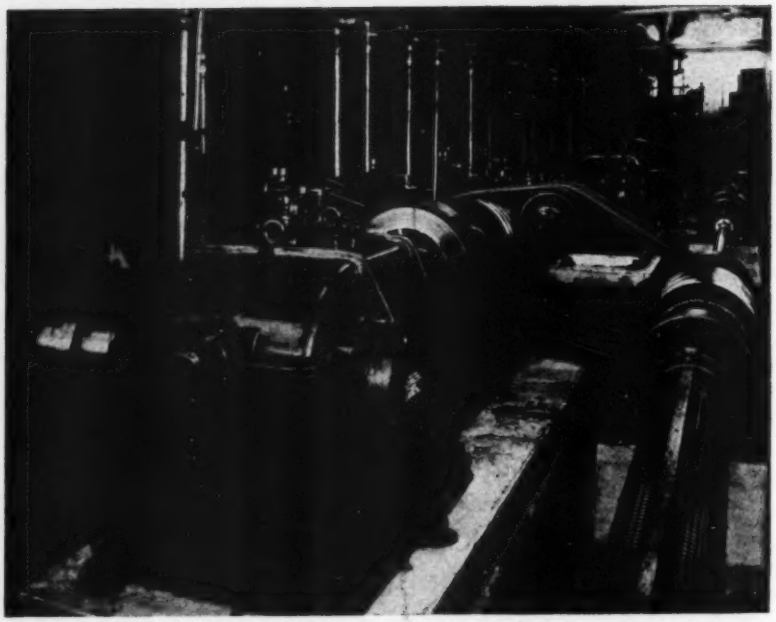
The problems involved, and to which there are still no exact answers are direction of flow in relation to the direction of movement of the cylinder mould, the rate of flow in relation to the surface speed of the cylinder mould, the quantity of flow, the size of the cylinder mould, the available differential head and the distribution of the approach flow.

The Sandy Hill vat which is offered for your consideration has some features which are widely used by all paper mill machinery builders. These are the fabricated design employing stainless steel and other corrosion-resistant metals and antifriction bearings.

The decision as to direct flow and counter flow is one which will be arrived at by conference between the buyer and Sandy Hill engineers. The Sandy Hill vat lends itself to either decision.

General design requirements make it desirable to come from the machine screens to the vat as nearly as possible at right angles to the travel of the felt. With the Bertrams design of multiple manifold approach flow unit the pipe from the screens may come to the distributor from any angle or distance and have no bad effect on the delivery to the circle.

To give further control of the distribution an adjustable slice is offered. By the use of this slice a partial direct flow and counterflow effect may be secured.



Sandy Hill selective drive installation

A fundamental of vat design in line with the present day paper mill thinking is the provision of generous white water discharge passages, cross overs and connections to a pump box or circulating pump. Papermakers are moving toward thinner and thinner consistencies and for many mills just the provision of increased flow passages would be a step in advance.

Paper machine screens have as their primary function making sure that each fiber floats alone before going into the vat. It breaks up lumps and tends to prevent those concentrations of fiber we call streaks. Some few mills still use paper machine screens for a last cleaning.

In either case, any improvement of the capacity per plate of the screen leads to a reduction of the size of the screens, economizing on space or by permitting the reduction of the slots gives a better cleaning and carding action within the same space.

Development in the war years has produced the following changes:

The permanent structure of the screen has been added to by making the diaphragm frame of cast iron rather than wood. The greater part of the frame does not come in contact with the stock. Those parts which do, the spouts, are made of silicon bronze.

These spouts are made 3" x 20" in cross section to give the greatest possible discharge from the individual diaphragm chamber.

The diaphragms are bolted to the frame with stainless steel bolts.

The all-metal screen is offered to the trade to conform to the present day thinking that corrosion-resistant metals are the materials to use for such a purpose. The all-metal screen includes vat and flow box of silicon bronze. Provision is made for screw-type plates or beveled-edge plates.

However, good cypress vats and flow boxes are still a sound investment if used with the cast iron frame.

A step in advance in standard equip-

ENGLISH ECCO CLAYS CLAYS

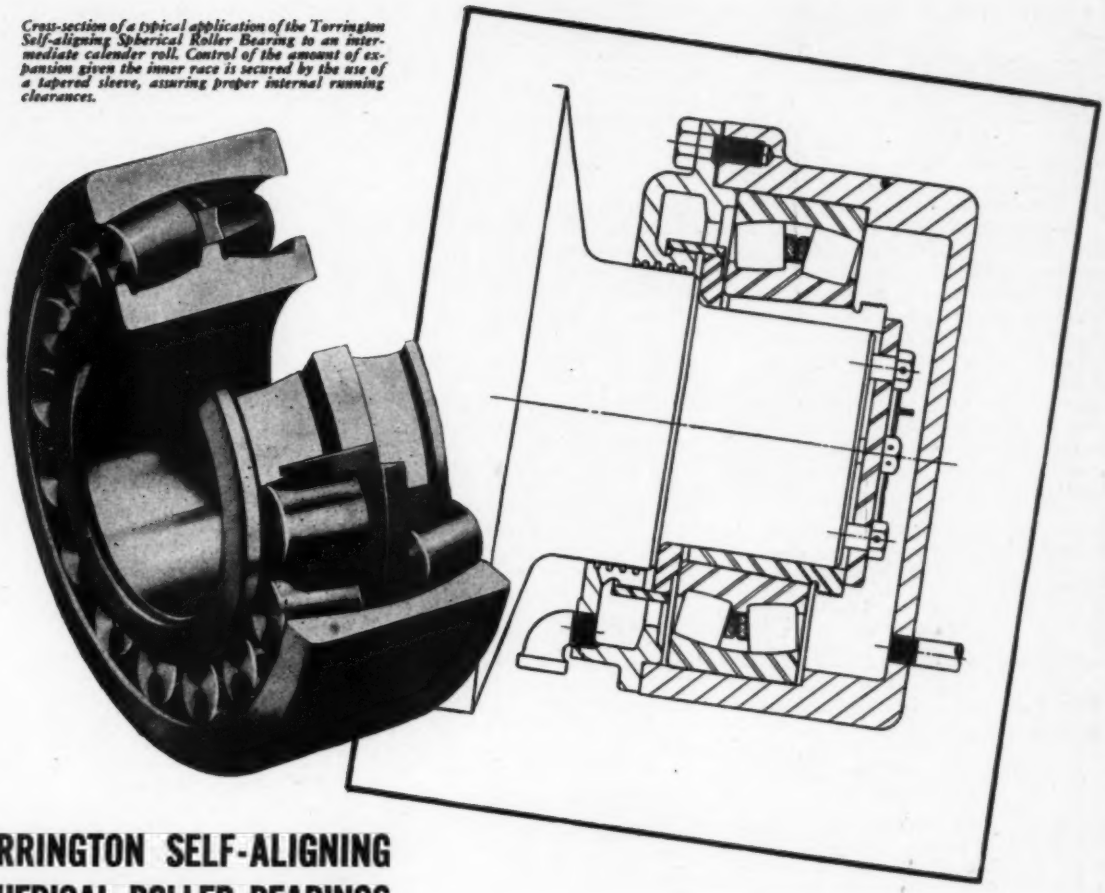
TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation

551 Fifth Avenue, New York City

Cross-section of a typical application of the Torrington Self-aligning Spherical Roller Bearing to an intermediate calender roll. Control of the amount of expansion given the inner race is secured by the use of a tapered sleeve, assuring proper internal running clearances.



TORRINGTON SELF-ALIGNING SPHERICAL ROLLER BEARINGS

. . . for economical operation

The demand for finer paper products at ever lower costs creates the need for increasingly efficient operation of heavy-duty paper machinery... exacting top performance from every component part.

In many applications . . . on chippers, beaters, Jordan engines, screens, press, drier and calender rolls . . . Torrington Spherical Roller Bearings will help increase efficiency of paper production at marked economies. Featuring self-alignment under all operating conditions . . . high radial capacity combined with two-directional thrust capacity . . . and unit construction for easy installation and servicing . . . they stand up under exacting demands.

With years of experience in designing and building bearings for industrial needs, Torrington's Bantam Bearings Division is prepared to help you adapt the Spherical Roller Bearing to your equipment. For further information contact your nearest Torrington Representative or write for our Bulletin No. 200.

THE TORRINGTON COMPANY
BANTAM BEARINGS DIVISION · SOUTH BEND 21, IND.

TORRINGTON BEARINGS

SPHERICAL ROLLER · STRAIGHT ROLLER · TAPERED ROLLER · NEEDLE · BALL

ment on flat screens is the provision of dams for each two plates. This permits the adjustment of flow through the screen so that each plate takes its share of the flow. Increased production may be obtained in this way. There is also increased cleanliness since there are no diaphragm chambers left to dry up.

The real progress in screening capacity has been in the adoption and improvement of roller shoes. The essential principle of the Packer screen—the free fall of the agitating mechanism—was preserved when the Fancher roller shoe was invented. The Fancher roller shoe gave the Packer screen a maintenance of capacity which amounted to an increase of 50 per cent per plate.

The free fall principle of the Packer screens is easy in its action on plates and avoids any tendency to pull dirt if there is a temporary matting over stock on the plates.

Abridgments in this section are from papers presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, held in New York City, February 25-28, 1946.

Film Properties and Utilization Of Resin-Starch

C. C. KESLER[1], J. F. KILLINGER[2], and E. T. HJERMSTAD[3]

Starch in its unmodified state possesses many of the properties which make it useful as an adhesive or bonding agent. Certain chemical and physical alterations are necessary in order to make it suitable for paper coating. Excellent results have been attained in adjusting starch to the range of consistencies required in various coating operations, in preventing set-back of certain varieties, and increasing adhesive power. There are, however, certain inherent properties of corn starch and other varieties which are undesirable in sizing and coating operations. The amylose, or straight chain fraction, often contributes undesirable gelling and retrograding characteristics (Kerr, *Paper Trade J.* 115, No. 23: 30, 1942); all varieties of starch, when pasted and dried, are extremely brittle and apparently low in tensile strength at low humidities; all starch films are greatly weakened by contact with water, and films of many varieties shrink excessively on drying. These and other characteristics make it desirable that economical methods be developed to correct them, since starch is, after all, probably the best low cost bonding agent for paper coating.

The percentage moisture content of a film determines the extent to which it will shrink on drying. However, the amount of shrinkage of a given material may be much higher or lower than that of another material which retains almost identically the same percentage of moisture throughout a wide range of humidities. The different varieties of starches, when gelatinized and dried as films retain about the same percentage of moisture at from 85 to 10% relative humidity. This agrees with the data of Sair and Fetber (*Ind. & Eng. Chem.* 36: 316, 1944). Waxy maize, which yields negligible amylose or straight chain fraction, shrinks considerably less.

Various modified starches and other organic materials were found to retain the same percentage of moisture, especially at low humidities, yet the total amount of shrinkage at low humidities varied widely. This indicates that moisture is not the only factor involved in the shrinkage of drying films. The indication that starches yielding the amylose fraction contribute to greater shrinkage would suggest that a film containing straight chain polymers allows a denser packing or drawing together of the chains as moisture is removed, than is the case with branched chains. This is further indicated by the high shrinkage at high humidities of polyvinyl alcohol which contains straight chains, although this may result from a different moisture equilibrium.

Additional evidence is the action of urea formaldehyde resins to reduce the shrinkage of starch films. When a modified corn starch is cooked in an acid condition with a urea formaldehyde resin, the resulting paste forms films with lower shrinkage values from films of the starch alone. The degree of shrinkage depends on the amount of resin used. The percentage moisture retained over a wide range of humidities is approximately the same for films of starch alone and those of urea formaldehyde resin treatment. Since the lowered shrinkage is not due to plasticization by moisture, it appears that the resin has changed the starch to a more highly branched material, probably the amylose being affected, since gelling and retrograding properties are greatly reduced by this treatment.

Another indication of the effect of the resin on the starch is the increased hysteresis of moisture sorption of the moisture-free films of starch-resin as against those of starch alone. Increasing amounts of resin decreased the per cent of moisture regained after vacuum drying. This may indicate a condensation of the resin with the hydrophilic groups in the starch thus preventing adsorption of water molecules on these groups, giving a partial stabilization (Stamm and Seborg, *Ind & Eng. Chem.* 28: 1164-1169, 1936).

Corn starches, treated so that films made from them exhibit minimum shrinkage, have desirable properties for the production of coatings, adhesives, and surface sizes. The advantages noted in such adhesives are increased cohesiveness, less retrogradation or gelling, less wetting into the base stock, higher gloss, and improved spreadability.

For coating, a starch or gum is used that has only a minimum of cold water soluble content so that the maximum of adhesive strength is preserved and the properties that have limited their use are modified by the reaction with resins. The different requirements for coatings of low, medium, or high density will not be reviewed here as the recent literature (J. F. Halladay, *Mod. Packaging* 17: 111-115, 1944) (F. W. Egan, *Paper Trade J.* 121: 49-54, 0.25, 1945) and contemplated publications (TAPPI Coating Monograph, to be published) cover this subject in detail. It may be said that starch-resin reaction products can be made to give improved brushability, reduce dusting to a minimum on the calenders, good wax tests, good printability, and high gloss.

The increase in cohesiveness of all starches after reacting with resins is manifested in the deposition of higher coating weights. Starch-resin coatings in actual mill comparisons of equal solids coatings and the same machine settings showed a substantial increase in coating weights.

The small percentage of resin sufficient to bring about the colloidal change in the starch will impart little or no water resistance to the finished coating. This is quite understandable when one considers the small amount of resin the reacted starch process contributes to the coating solids as a whole.

Where additional water resistance or increased washability is desired, unreacted resins may be added to the finished coating mixture. Where subsequent additions of resin are made for this purpose the *p*H of the finished coating will, of course, be maintained on the acid side.

Actual tub sizing operation employing sizes prepared from medium viscosity starches and urea resin has shown some very remarkable results, e.g., a starch hydrated in the presence of 10% resin in a 10% concentration and subsequently diluted to 5% total solids gave results as tabulated in Table 2.

Table 2—Size Press Application

Test	Starch Alone, Per Cent of Standard	Starch-Resin, Per Cent of Standard	Per Cent Increase or Decrease
Bursting strength	80	100	+ 20
Tear—with	117	115	— 2
Tear—across	124	122	— 2
Fold—with	30	50	+ 66
Fold—across	25	90	+260
Porosity	57	83	+ 45
Oil adsorption	73	180	+146
Gurley—felt	115	127	+ 1
Gurley—wire	97	130	+ 34
Brightness	108	110	+ 2
Gloss—felt	98	100	+ 2
Gloss—wire	96	101	+ 5

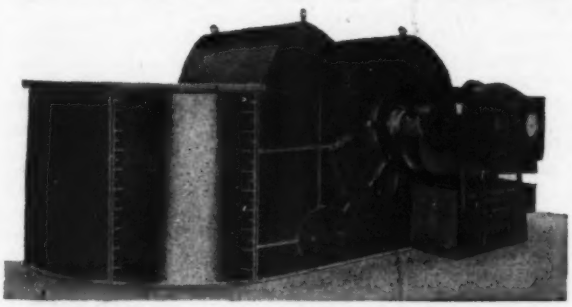
To date, tub sizing comparisons have been made at several mills where quite widely differing starches were employed. In each case the reacted starch showed substantially the same increased advantages.

It was contemplated to include some experience gained by the addition of resin-starch to the wet web before any drying was accomplished. Regrettably time has not permitted the completion of these data. It would appear that reacted starch and resin may be expected to show some unusual internal sizing values, particularly with reference to improved wet strength. Application at this point would reduce to a minimum loss of resin and starch since the application would be made after the sheet has passed the presses.

The excellent results obtained in the tub indicated further application on the calenders for improving surface characteristics of board. Starches exhibiting the proper viscosity are reached with resins and applied to the stacks in concentrations up to 20% total solids. The per-

(1) Director of research, (2) manager, Technical Sales Service, (3) research chemist, Penick & Ford, Ltd., Inc.

with the JONES-BERTRAMS PATENT BEATER



The greater paper mileage which the Jones-Bertrams Patent Beater delivers is the result of its unique design and construction. Replacing three, four, or even more regular beaters, its operation naturally provides for greater production . . . with horse power savings per ton from 35% to 60%.

UNIFORM FIBRE TREATMENT
SHORT BEATING CYCLE
AUTOMATIC CONTROL
LOW H.P. PER TON

Jones

E. D. JONES & SONS COMPANY, Pittsfield, Mass.
Builders of Quality Machinery for Paper Mills.

centage of resin may be varied widely. Five to twenty per cent based on the dry weight of the starch gave, in actual operation, decided improvements. The reaction product made with quite high percentages of resin has a consistency range of the base starch, and remains so over a wide pH range and for prolonged periods. It was found that substantial increases in both wet and dry rub values were obtained on kraft board. The resistance to turpentine, lard, and tall oil absorption was greatly increased. The starch when properly reacted may be incorporated with other adjuncts often used with starches as prepared for sizing.

The changes in physical and colloidal properties obtained by reaction with resin indicate that the use of this type of starch will be found to be quite advantageous not only in coating and sizing operations but in adhesive and film applications not necessarily limited to paper manufacture or paper conversion.

Industrial Uses of Alkali Lignin

E. B. BROOKBANK, Development Dept.
The Mead Corporation

Alkali lignin has been produced on a semicommercial scale under the trade name of *Meadol* for approximately 10 years. During that period it has been evaluated and tested for a considerable number of industrial uses. For some of these, it has proven to be entirely satisfactory while for others, its use results in properties which are border-line between acceptable and nonacceptable performance.

The term alkali lignin has been used in the literature to designate the product obtained by acidulation of the alkaline black liquors from the soda pulping process. Such lignin contains all organic matter which is precipitated by mineral acids and is somewhat heterogeneous in nature. In contrast, Meadol is obtained by fractional precipitation of the hardwood soda black liquor with carbon dioxide (Brookbank, E. B., *Chemurgic Digest* 2, No. 11: 97-9, June 30, 1943).

Compared to other chemical materials, lignin is quite inert. The lignin is thermoplastic with a melting point of about 210 C., but this melting behavior is not completely reversible. Moisture acts as a plasticizer and 10 to 12% water will depress the melting point to about 170 C. The moisture-free melting point correlates with the amount of ash in the product; the lower the ash content, the lower the melting point. The minimum moisture-free melting point on carefully purified, ash-free alkali lignin is 190 C.

The decomposition temperature is approximately 230 C. and a considerable quantity of gaseous products of decomposition is formed. An increase in ash content tends to raise this decomposition temperature. It is insoluble on nonpolar solvents and soluble to varying degrees in polar solvents. The most effective solvents are alkalies, pyridine, dioxane, and a mixture of equal parts by volume of acetone and methanol.

In considering uses for this material, knowledge of its physical and chemical properties suggests a number of possibilities. For example, the presence of reactive hydroxyl groups gave considerable impetus to study for plastic applications (Kline, Gordon M., *Modern Plastics* 17, No. 4: 39; No. 5: 46, April, May, 1937). It has been extensively investigated as an ingredient of thermosetting phenolic resins. Various methods of incorporation of the lignin into the resin have been considered, with varying degrees of success.

In general, all efforts result in a slight decrease in the quality of the finished product. This is manifested particularly with respect to water absorption and mechanical strength. Resin flow is somewhat stiffer and slightly longer curing times are required. Even so, such compounds are adequately strong and sufficiently water resistant for many uses.

A considerable amount of work has been done to incorporate alkali lignin and other lignins into paperbase plastics for lamination of flat panels (Stamm, Alfred J., Forest Product Laboratory Report No. R1482; 4, December, 1944). In this case, the lignin is dissolved in the resin varnish, which is then used to impregnate an absorbent paper, or lignin is added as a filler to the paper on the paper machine, and this combination later impregnated with phenolic resin varnish. Physical properties of some of these laminates have been every bit as acceptable as those obtained with straight phenolic varnishes. Here, the lignin serves a further purpose in that it makes the saturated paper less tacky during the drying operation and thus prevents build-up of resin on drier rolls. Similar studies have been made on pulp molding operations, but here a general but small decrease in mechanical strength has been observed (Schwartz, S. L.; Pew, J. C., and Meyer, H. R., Forest Products Laboratory Mimeo No. R1461, February, 1945).

Alkali lignin has been extensively used as the organic expander in the negative plates of storage batteries (Willihnganz, Eugene, Paper presented at the fall meeting of The Association of American Battery Manufacturers, Inc., October 22-23, 1942, at Chicago, Ill.). Today, the majority of the automobile batteries manufactured in the United States use this material. In practice, from 0.2% to 1.0% of alkali lignin is mixed with litharge, carbon black, and barium sulphite, followed by pasting to lead grids and assembly of the battery in the conventional manner. In this application, the stability of the lignin to battery acid is of prime importance.

It is effective as an emulsifier for asphalts and is compatible with asphalts of certain types to a fairly high degree. When used in conjunction with tall oil soaps, it produces emulsions of greater stability than can be obtained with soap type emulsifiers alone. Further, by proper formulation, the demulsibility of these emulsions may be adjusted to any desired value, thus greatly extending the field of usefulness of these systems. This may find future application in the manufacture of paving asphalt emulsions and it is possible that such emulsions might also prove useful in the sizing of paperboard.

When added to high melting asphalts in small amounts, it reduces the amount of cold flow. This suggests its use with this material for cheap thermoplastic molding compounds.

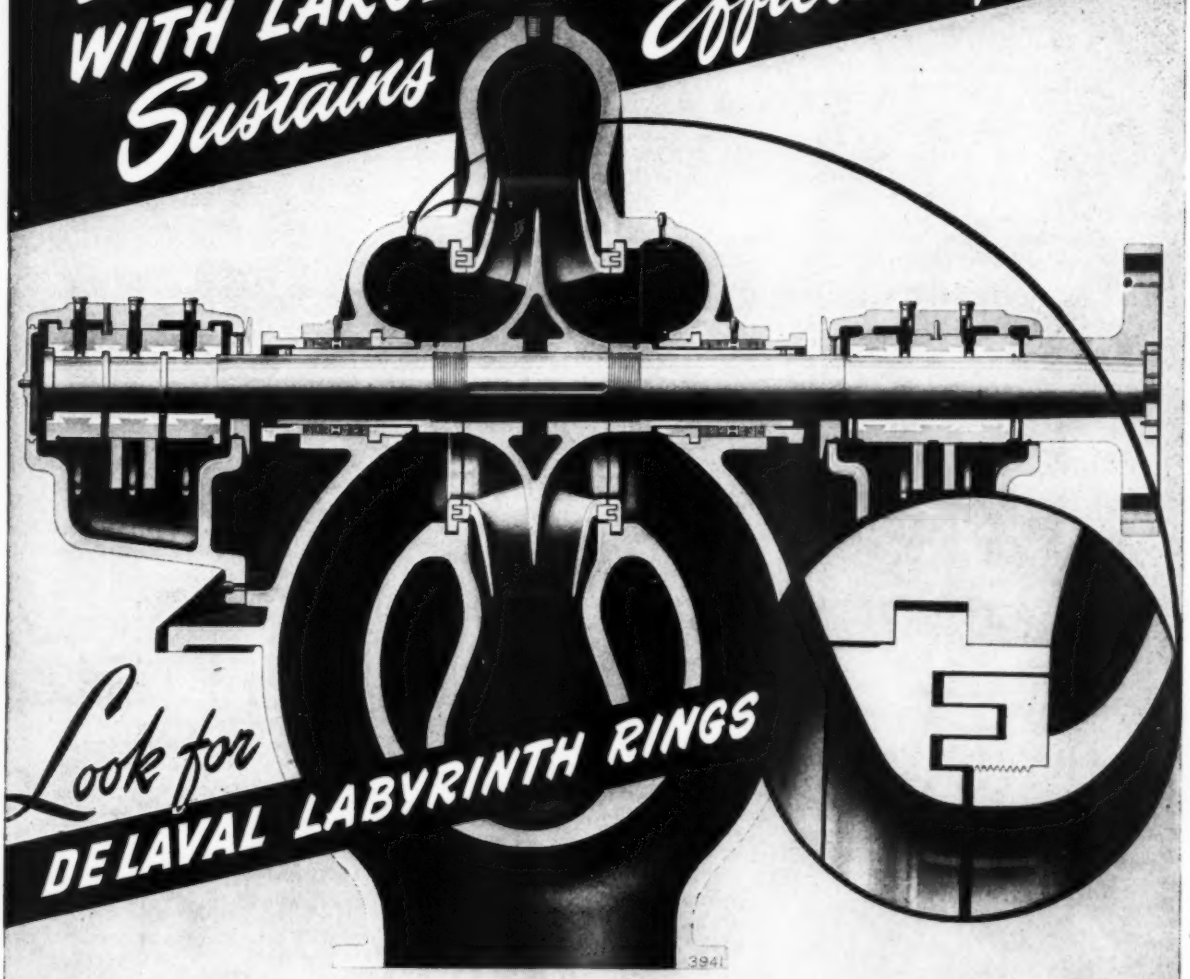
Other possible uses for lignin depend on its base exchange properties. Some of these are as a carrier for insecticides, as a means of conditioning boiler water for the prevention of scale and caustic embrittlement (Betz, L. Drew, *Pulp Paper Mag. Canada* 40: 119-21, February, 1939), as a method for removing iron from industrial water supplies (Nelson, G. H., and Aronovsky, S. I., *Paper Trade J.* 113; T. S. 239-245, November 6, 1941) (Nelson, G. H., Levine, Max, and Lynch, D. F. J., *Paper Trade J.* 108; T. S. 117-120, March 2 1939), and as a dispersing agent for oil well drilling muds (Zacher, V. B., U. S. patent 2,212,108, August 20, 1940). It may also be used for ion-exchange water softening, since the lignin has a good affinity for both calcium and magnesium, and regeneration may be accomplished with any mineral acid. While none of the above uses have reached a commercial scale, all are currently receiving careful study on a semicommercial or pilot plant scale.

Other uses which have been suggested are for such things as floatation agents, grinding aids, adhesives, and core binders. Some of these uses are ruled out by economic considerations at present.

Since lignin will form association complexes with proteins, it has been studied as

D&T
MICROMETERS
SNAP GAGES &
SPECIAL TOOLS
Bow and bar type micrometers with sliding mandrels that give you 6 in. of range with 3 standards. Capacities: 0 to 6 thru. 162 to 168.
Snap Gages—Rigid construction accuracy from 5 in. upward.
Interchangeable Anvil Micrometers with 3 setting standards insure 6 in. of measuring accuracy.
Tubular frames are of highest quality welded construction. Micrometer heads produced by nationally recognized manufacturer.
DAVIS & THOMPSON CO.

LESS LEAKAGE WITH LARGER CLEARANCES Sustains Efficiency



De Laval Labyrinth Wearing Rings contribute in a large measure to sustaining the high efficiency of De Laval pumps. The large clearance, tortuous labyrinth passage reduces leakage to a minimum and maintains ample running clearances under all conditions.

For sustained efficiency and reduced maintenance costs look for De Laval Labyrinth Wearing Rings when buying centrifugal pumps.

3235

TURBINES • HELICAL GEARS • WORM GEAR SPEED REDUCERS CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS and COMPRESSORS • IMO OIL PUMPS

DE LAVAL

STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

SALES OFFICES: ATLANTA • BOSTON • CHARLOTTE • CHICAGO • CLEVELAND • DENVER DETROIT • DULUTH • EDMONTON • GREAT FALLS • HAVANA • HELENA • HOUSTON KANSAS CITY • LOS ANGELES • MONTREAL NEW ORLEANS • NEW YORK • PHILADELPHIA PITTSBURGH • ROCHESTER • ST. PAUL • SALT LAKE CITY • SAN FRANCISCO • SEATTLE TORONTO • TULSA • VANCOUVER • WASHINGTON, D. C. • WINNIPEG

a means for the quantitative separation of mold protease enzyme from the original cultures (Wallerstein, James S., Alba, Ralph Thomas, and Hale, Mary G., *Arch. Biochemistry* 7, No. 2: 357-65, July, 1945). Enzymatic activity is not impaired after regeneration of the protease. This work has not passed beyond a laboratory stage but indications are that such a process would be entirely practical on a larger scale and may result in appreciable savings over the methods of separation currently used. These studies have recently been extended to cover malt and mold amylase with gratifying results. Almost complete recovery is achieved in terms of the original enzyme when the determination is carried out at a *p*H at which the enzyme lignin is fully dissociated and thus completely reactivated (*p*H 6.5 or higher).

This reaction between lignin and proteins has also been suggested as a means of removing wheat proteins from fermentation residues (Farber, Eduard, Maengwyn-Davies, Gertrude D., and Wallerstein, James S., *Chemical Eng. News* 23: 617, April 10, 1945). Precipitation of the protein is almost quantitative, filtration is rapid, and elimination of insolubles and colloidal solubles may be achieved. The filter cake has value as a cattle feed, while the resulting liquor residue which contains unfermented sugars and small amounts of nitrogenous material, may be utilized for producing protein in the form of yeast. The utilization of the stillage is thereby made more complete and feeding materials of high nutritive value are produced. The effluent, after yeast growth shows less than half the biological oxygen demand of the original stillage.

Hydrogenation of alkali lignin leads to a variety of products, such as methanol, methane, neutral oxygenated oils, acidic tars and hydrocarbonna (Harris, Elwin E., *Ind. Eng. Chem.* 32: 1049-52, August, 1940). Since coal is a cheaper starting material and yields similar products, the outlook for this form of commercial lignin utilization is not very encouraging.

The foregoing uses are based on lignin as it is currently manufactured. It is possible to carry out additional chemical reactions to form salts of most of the metals and many of these compounds have been prepared.

The lignin may also be esterified or etherified (Brauns, F. E., Lewis, H. F., and Brookbank, E. B., *Ind. Eng. Chem.* 37: 70-3, January 1945) (Brookbank, E. Bruce, Brauns, F. E., Lewis, H. F., and Buchanan, M. A., *Paper Trade J.* 116, No. 13: 27-8, April 1, 1943). A considerable number of alkyl esters and ethers have been prepared on a laboratory scale. Melting and solubility characteristics of these products can be varied over a wide range by proper selection of the alkyl radical. When substituent groups of high molecular weight such as the stearyl radical are used, the resulting products possess waxy characteristics which may be of definite commercial interest for lubricating greases and as lubricants for thermo-setting molding compositions. These modified solubility characteristics, and the increased range of compatibilities resulting will suggest still other uses.

Magnesium Base Sulphite Pulping

RAYMOND S. HATCH, Director of Research, Pulp Division Weyerhaeuser Timber Co.

During the past decade, there has occurred a renewed interest in what to do with the waste liquor from the sulphite process.

The utilization of the solids in sulphite waste liquor has been approached from two different points of view: one group of workers has actively endeavored to convert the organic material into useful chemical compounds or to extract from the waste liquor by precipitation or other means the lignin or carbohydrates in such a manner that they will find commercial outlets. A considerable measure of success has attended these efforts and numerous products produced from waste liquor have found a more or less restricted market.

The total production of sulphite pulp in North America amounts to approximately 14,500 tons per day, which means that somewhat over 14,500 tons per day of organic solids are available which might serve as a starting material for an organic chemical industry.

The B.t.u. value of the dry organic solids present in waste liquor lies between 7000 and 8000 B.t.u. per pound. This material, under the proper conditions, offers a valuable source of energy in the form of fuel. If, in the process of utilizing the organic solids as a source of energy, it is found possible to recover the chemicals used for producing the pulp, there would result a cyclic process in which all of the resultant products could be utilized by the pulp manufacturer and no effort would have to be expended in the search for markets outside of the pulp industry.

Because of the seldom recognized property of magnesium sulphate of reducing to caustic magnesia under certain operating conditions rather than to the sulphide, as is true of calcium sulphate, such an aim can be economically accomplished by changing the base used in the manufacture of cooking liquor from calcium to magnesium. The magnesium base waste liquor is evaporated and burned under prescribed conditions. The highly reactive caustic magnesia which forms the main portion of the resulting ash is collected from the flue gases, made into a slurry, and advantageously used to absorb the SO_2 in the flue gases to form fresh cooking liquor.

This process was disclosed in a paper by Tomlinson and Wilcoxson (*Paper Trade J.*, 110, No. 15: 31-38, April 11, 1940) and presented before the Technical Association during the February meeting in 1940. At the same time that Tomlinson and Wilcoxson were carrying on their investigation, the Pulp Division of the Weyerhaeuser Timber Company was independently developing the same process. The three groups eventually entered into a co-operative arrangement, the object of which was to utilize all of the experience gained in the study of this process and the various patent rights acquired and to offer to the industry an efficient and economical answer to the problem of waste liquor utilization. It was decided that the mill of the Pulp Division of the Weyerhaeuser Timber Company, located at Longview, Washington, would be the first to change over to the new process. The entry of the United States into World War II prevented the immediate conversion of the Longview mill to this process. With the cessation of hostilities, however, and with the availability of the necessary materials of construction, plans are now going ahead and it is hoped that the Longview mill will be converted and in

TENAX
"TENAX FELTS ARE TOUGH"
WHEN ORDERING FELTS
. . . Specify TENAX. There's a TENAX FELT to meet every specification, in making paper, board and allied products. Let TENAX bring you peak operating efficiency and greater economy!
LOCKPORT FELT COMPANY
NEWFANE, N. Y.
Serving the paper industry since 1891

TRANSMISSIONEER...

WHO'S HE?

He's a graduate of a Dodge factory course, qualified by intensive training and a broad practical experience to give you the latest answers to problems in efficient mechanical transmission of power—in your plant or as applied to your product.

The Transmissioneer is backed by a broad line of Dodge bearings, sheaves, pulleys, clutches and other drive components. He is qualified by training and experience to select elements which make *the right drive for the job.*

Typical of the engineering advancement which marks Dodge products is the new Taperlock sheave, which has the simplest, surest mechanism ever devised for fastening wheels to shafts. For information about Taperlock—and other new developments in the mechanical transmission of power, call the Transmissioneer — your local Dodge distributor. Most power drive requirements can be supplied direct from the distributor's stock.

Look in the classified telephone directory under "Power Transmission Equipment" for your Transmissioneer's name and number. Call him for advice—without obligation.

DODGE MANUFACTURING CORPORATION, MISHAWAKA, INDIANA

To obtain his diploma every Transmissioneer must pass an intensive course of training at the Dodge factory. Lectures, classroom work and practical demonstrations of power transmission problems make up the course.

DODGE
MISHAWAKA

THE SYMBOL THAT CAME TO LIFE

257 factory graduate Transmissioneers wear this sign of a nation-wide personal service that helps you put all your power into the job.

Copyright, 1946, Dodge Mfg. Corp.

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

operation in the course of the next eighteen months.

The purpose of this paper is not to repeat the substance of the paper which was so well and thoroughly presented by Tomlinson and Wilcoxson, but, rather, to indicate those improvements and modifications which have been suggested as the result of co-operative study and experience.

It is possible to cook wood with solutions of magnesium bisulphite having a very much higher concentration than is possible with solutions of calcium bisulphite. The possibility of lowering the liquor ratio to moisture free wood was very thoroughly investigated by Paimrose (U. S. pat. 2,192,239, March 5, 1940) who demonstrated, in the course of his work, that liquor ratios as low as 2.5 pounds of total liquor per pound of moisture free wood could be successfully used for cooking provided circulation in the digester was so arranged that the liquor could be circulated from the bottom of the digester to the top and caused to cascade down through the chips in such a manner that the chip charge was kept continually wetted with the circulating liquor.

By lowering the liquor ratio, the concentration of dissolved solids can be materially increased and the steam requirements for evaporation and for cooking can be materially reduced. For example, when operating with a liquor ratio of 4.5 pounds of total liquor per pound of moisture-free wood, and evaporating the waste liquor to a concentration of 60% total solids, the over-all steam requirements will be 25% greater than when operating with a liquor ratio of 2.5 pounds of total liquor per pound of moisture-free wood. In both cases, when burning waste liquor of 60% total solids, the same amount of steam is generated.

By generating steam at relatively high pressures, ample power for the operation of the mill can be extracted in suitable turbine equipment; the exhaust from which furnishes process steam.

Data accumulated in the operation of the pilot plant at Cornwall, Ontario, and that built and operated at Longview, Washington, indicate that the recovery of magnesium oxide is very high; the only losses of magnesium are the very small amounts retained by the pulp in the counter-current washing of the pulp on vacuum filters. There is little tendency for pulp to absorb cooking chemicals, wherein the sulphite recovery process differs quite distinctly from the alkaline recovery process. The combustion gases leaving the furnace are very low in SO_2 concentration and a small amount of sulphur is converted to SO_3. It has been found, however, that this SO_3 is absorbed and appears as magnesium sulphate in the regenerated liquor. This magnesium sulphate, being very soluble and inert, has no effect in the cooking operation, and when returned to the furnace is broken down to magnesium oxide and SO_2. Experience has shown that the magesium sulphate gradually builds up to an equilibrium point and then remains constant. At equilibrium condition, the magnesium existing as sulphate amounts to approximately 7% of the total magnesium present.

Calcium salts extracted from the wood, or present as impurities in purchased magnesium oxide, are removed from the magnesium bisulphite solution, leaving the absorption towers by means of suitable filters. These calcium salts appear as calcium sulphate or calcium monosulphite and are thus the cause of some sulphur loss. This sulphur loss can be kept at a minimum provided a magnesium oxide of high purity is purchased.

With the tremendous development which occurred during the war in the production of metallic magnesium, large-scale facilities were installed for the production of a magnesium oxide of high purity from sea water. This makes available an ample supply of pure magnesium oxide for the operation of this process. A review of the data accumulated in the operation of the pilot plant indicates that the magnesium loss in the operation of the process should not exceed 5%, and the sulphur loss can probably be kept down to not more than 10%. It will thus be seen that a mill normally using 250 pounds of sulphur per ton of pulp, when operating under the magnesium bisulphite process, would require only about 25 pounds of sulphur per ton and something in the vicinity of 7.5 pounds of magnesium oxide per ton; a marked reduction in over-all chemical consumption. At the same time, when operating with relatively low liquor ratios, enough steam and power may be produced to operate the mill.

In the operation of this process, it is obvious that some changes must be made in the design of the conventional sulphite mill. When operating at low liquor ratio, it is neither possible nor desirable to blow the digesters. They should be blown down to atmosphere to recover the maximum amount of free SO_2 and heat. The digester is then washed out with strong waste liquor from previous cooks into a suitable chest from which the pulp is pumped to the countercurrent washing system. The strong waste liquor, prior to entering the evaporators, is neutralized with sufficient magnesium oxide to raise the pH to between 7 and 8. This avoids the breakdown of loosely combined sulphur compounds in the evaporators and results in maximum recovery of sulphur. It also prevents excessive corrosion of the evaporators. At the Longview mill, a new boiler house will be erected for the recovery system because, at present, steam is drawn from the sawmill boiler house. To insure a high percentage of caustic magnesia in the ash and a minimum conversion of SO_2 to SO_3, a special recovery furnace and boiler has been developed.

The absorption of SO_2 from the combustion gases, with a slurry made from the highly reactive ash recovered from the furnace, is a relatively simple operation. This is done in grid-packed towers, and a practically complete clean-up of the SO_2 from the combustion gases can be accomplished. In addition to calcium extracted from the wood by the cooking process, varying amounts of potassium are also extracted, depending upon the species, soil, and location of the forest. Under normal conditions, the potassium salts extracted are sublimed in the furnace and pass through the absorption system as a fume, although small amounts are retained in the ash. These potassium salts tend to reach an equilibrium concentration and no difficulties are expected from this source.

This process is very distinctly one which utilizes the energy values contained in the organic waste and recovers the chemicals used in cooking. It is definitely a solution of the stream pollution problem and this solution is accomplished in such a manner that all of the products of the process are immediately utilized by the pulp manufacturer. It is obvious that partial or total utilization of the organic waste may eventually be worked out. If the

"READY [illegible]" MILL COGS
LABOR SAVING—TIME SAVING
The Most Economical Fitting That Can Be Put In a Machine Wheel.
Ready Dressed
We Make Any Style or Size Wanted.
Write for Instruction Sheet "O" Which Is Free.
Blank Heel
QUICK SERVICE ON ALL SIZES
THE H. P. BOWSHER CO., South Bend, Ind.

COLORS . . .
for Board and Paper
Green Chromium Oxides
Black, Brown, Red, Yellow Iron Oxides
Lamp Black—Umbers—Venetian Reds—Yellow Ochres
C. K. WILLIAMS & CO.
Easton, Pennsylvania

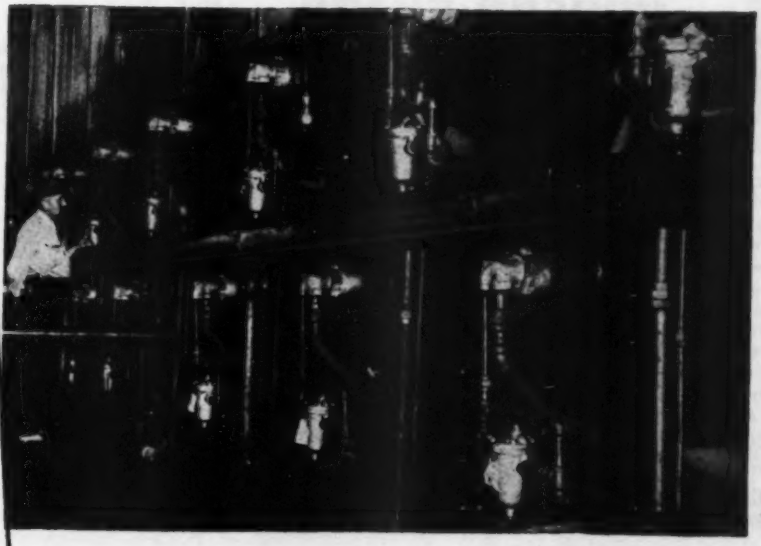
Specially designed

for paper machine

DRYER DRAINAGE SERVICE

QUICK FACTS

- **SPECIAL DESIGN.** Armstrong has designed a trap to meet the special requirements of draining individual paper machine dryers.
- **BIG AIR HANDLING CAPACITY.** Vents air from cold dryers; continues to purge air from hot dryers.
- **FACILITATES PRESSURE CONTROL.** Provides a definite stopping point for live steam; permits accurate control of steam pressure (and temperature) in each dryer.
- **TROUBLE-FREE PERFORMANCE.** Very simple construction. All stainless steel mechanism of same design and construction used in forged steel traps for 1500 p.s.i. and 900°F.
- **LONG LIFE—LOW MAINTENANCE.** Where ordinary traps wear out rapidly on paper machine service, the specially designed Armstrong trap has demonstrated ability to stay on the job with no more maintenance than for ordinary service.

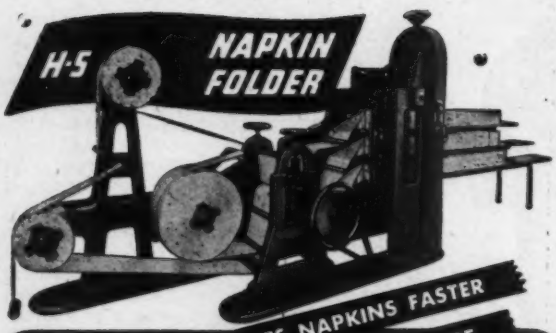


Engineering Service . . . Armstrong Machine Works specializes in solving paper machine drainage . . . pressure control . . . temperature control . . . and sheet moisture control problems. If you have a special problem, check with Armstrong for an efficient economical solution. If you need modern, efficient drainage, use Armstrong paper machine traps.

ARMSTRONG MACHINE WORKS
816 Hoffman St., Three Rivers, Michigan

Inverted Bucket Steam Traps for Every Paper Mill Requirement

Dryer Drainage System Trapping and Engineering



PRODUCES NAPKINS FASTER
. . . THAN EVER BEFORE

MORE and better napkins with our post-war No. 2-A folder. Makes all folds — quarter fold, eighth fold, sixteenth fold and dispenser fold — on one machine. This unusual versatility, plus our usual quality, makes this multiple duty folder an important addition to your production department. Write for information.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

KEEP MILL MAINTENANCE COSTS DOWN WITH EASY OAKITE CLEANING

Cleaning Holding Chests More Quickly

To help sustain your production at its peak, maintenance jobs such as cleaning holding chests can be expedited by the modern, Oakite Steam-Detergent Cleaning Method.

This widely-accepted technique, utilizing the Oakite Solution-Lifting Steam Gun, combines heat, mechanical force and vigorous Oakite detergent action to make possible highly effective economical cleaning. Slime, grease and similar soilage are easily removed in a fraction of the time formerly required by laborious manual methods.

For further information or for an actual in-plant test, get in touch with your nearby Oakite Technical Service Representative. When writing, ask him, or us, for 28-page Maintenance Cleaning Guide. FREE!

OAKITE PRODUCTS, INC., 16 Thames St., NEW YORK 6, N. Y.
Technical Service Representatives Conveniently Located in All Principal Cities of the United States and Canada

OAKITE *Specialized* **CLEANING**
MATERIALS • METHODS • SERVICE • FOR EVERY CLEANING REQUIREMENT

financial return from organic compounds which may be produced from waste liquor can be made to exceed the fuel value of the waste liquor solids, and if markets can be found that will absorb these compounds, undoubtedly an organic chemical industry may be founded on the organic waste material, but until such conditions exist, the magnesium bisulphite process seems to offer the best method of utilizing the waste liquor solids and at the same time doing away with the problem of stream pollution.

Developments in Newsprint Manufacture

W. G. McNAUGHTON, Engineer
News Print Service Bureau

I have been associated with newsprint mills for more than 35 years. In response to the presentation of the TAPPI Medal, I should like to review briefly the progress that has been made in the newsprint industry during this time—that is, since about 1908.

During my college vacation in 1902, I worked at Canada Paper Company, Windsor Mills, Quebec. At that time, a newsprint machine was being installed. This machine was designed as the largest and most modern machine. Actually, this machine was equipped with two rolls and was approximately 160 inches in width. A water wheel, regulated by a speed governor, was the source of power. To the best of my recollection, the machine was designed to operate at about 500 fpm.

In 1908, several mills in the United States installed somewhat similar two roll newsprint machines. The average operating speed of these machines was about 400 feet per minute but there were records of speed attainments of as high as 535 fpm. (According to the chronology in *Paper Making*, the textbook of the Crown Willamette Paper School at Camas, Washington.)

Modern newsprint machines have been built with a maximum width of 329 inches. The usual width is about 234 inches for a production of three full newsprint rolls. Today the average speed of newsprint machines is approximately 1200 fpm. The maximum record, I believe, is about 1600 fpm.

The modern newsprint machine is equipped with antifriction bearings and electrical sectional motor drive. Close adjustment of speed for each paper machine section is used. Rotary screens, self cleaning, operate continuously. Years ago long wooden flow boxes with several baffles and passes were used as a breast box. Now a single compartment headbox connected directly to a high-head inlet delivers stock to the machine wire at a controlled speed. The high inlet has taken the place of the pond and slice. The old pond and slice on the wire was very suitable for low speeds approaching 500 fpm.

As the speed of more modern machines increased, the dandy roll was used less and less. Later on, the shake at the wire was discontinued. Eventually, the endless deckle straps of heavy rubber, riding on the wire, were replaced by stationary deckle boards. All of these improvements simplified operation and contributed to more efficient operation at increased speed.

The use of suction rolls at the couch and on the press is replacing the jacketed top-couch rolls and the rubber or metal covered press roll. The use of suction presses has practically eliminated the third press. The third press was used not only to remove additional water but also to reverse the sheet at the last press. The modern paper machine provides for a straight path of paper from couch to dryers. The transfer of the paper web from section to section is accomplished by compressed air or carrier ropes because these operations may scarcely be done by hand at modern speeds.

The application of automatic temperature control and the use of exhaust vapor from the dryers to heat the ventilating air are among these improvements. In addition, another outstanding development which has not been applied broadly, is the application of vacuum to drying paper. Modern machines are equipped with modern reels which operate at constant and controllable speed and which have replaced the vertical double reel. The constant speed reel and the application of a roll winder, designed especially for newsprint rolls, have reduced remarkably pressroom difficulties caused by variations in density of the rolls.

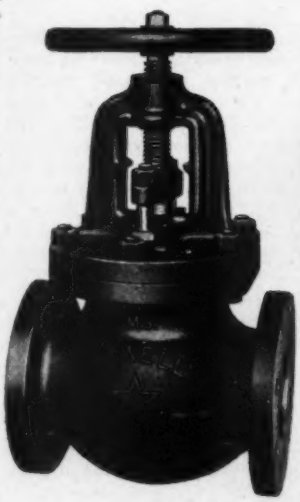
Let POWELL guide your way to assured, unfailing flow control

Through the ages, men on land and sea have been guided to their destination by the *North Star*. It is easy to find because it is almost in line with the two stars on the right end of the "Big Dipper."

Many years ago Powell patented the famous "Star" Regrinding Globe Valve. Today, the *Powell Star*, backed by 100 years of accumulated technical knowledge and manufacturing skills, is serving Industry as a guide to assured, unfailing flow control. The Complete Powell Line includes valves for every known industrial service and as new demands arise Powell Engineers will design valves to meet them.

Catalogs gladly furnished on request. Kindly specify whether you are interested in Bronze, Iron, Cast Steel, or Corrosion Resistant Valves.

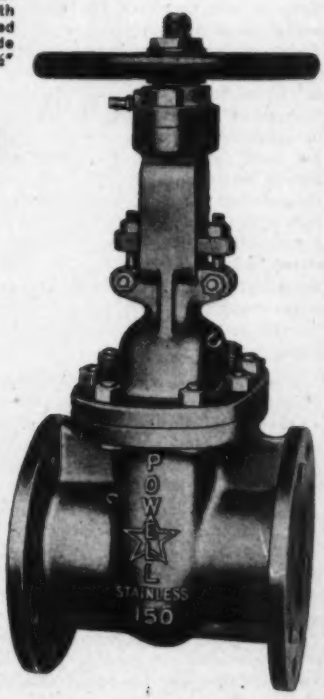
Large size 150-pound Stainless Steel "Y" Valve with flanged ends, bolted flanged yoke-bonnet and outside screw rising stem. Sizes 2½" to 12", inclusive.



Large Iron Body Bronze Mounted Globe Valve for 125 pounds W. S. P. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc. Also made in All Iron for process lines.

125-pound Iron Body Bronze Mounted Swing Check Valve with bolted flanged cap and regrindable, renewable bronze seat and disc. Also made in All Iron.

200-pound Bronze "White Star" Gate Valve with inside screw rising stem, union bonnet and renewable, wear-resisting "Powellium" nickel-bronze disc.



Standard 150-pound Stainless Steel Gate Valve with flanged ends, bolted flanged yoke-bonnet, outside screw rising stem and taper wedge solid disc. Sizes 2½" to 8", inclusive.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

Throughout the development work on the paper machine, the training and skill of technical staffs have been tremendous assets for the paper industry. The efficient operation of these machines could not be maintained without the conscientious attention and the skill of control staffs who follow closely the details of production of groundwood and sulphite mills, as well as the newsprint machine itself.

Modern groundwood mills employ technical methods (and still being constantly improved) for testing pulp freeness and rainage rate, fiber classification, blue-glass test of fiber appearance, strength properties, and the like. The technical man has not only developed these methods but has translated the use of these tests in terms of daily operation.

During the past 35 years, there has been tremendous growth and modernization of wood grinding equipment. The grinders have increased greatly in size. Perhaps the use of artificial pulp stones, the adaptation of electric drive, the controls at the pulp grinders, have been the most important factors in the production of unifrom quality of pulp. In addition, the efficiency, and ease of operation have been increased.

Pulp grinders are no longer driven by water wheels. When water wheels were used, it was necessary to accumulate a storage of pulp during high water periods. Today modern paper machines are supplied with groundwood and sulphite pulp in slush form; supplies are available throughout the year; and the use of pulp in slush form has made it possible to use such pulps without further preparation in beaters and jordans. Consequently, groundwood and sulphite pulps, closely regulated for consistency, are blended in a proportioning and mixing system. The mixed pulps are diluted to a controlled consistency with white water from the paper machine wire pit. The stock flows directly to the rotary screens and to the paper machine itself.

I spent some time at the Savannah Pulp and Paper Laboratory. There, in 1933, the investigations on the suitability of southern pine groundwood for newsprint, had developed to the point where commercial trials seemed desirable. The Director, Dr. Charles H. Herty, arranged for commercial trials to be made on a paper machine operated at a speed of about 850 feet per minute. Before the laboratory manufactured the southern pine groundwood to be used in the commercial run, samples were obtained of groundwood and sulphite normally used by the commercial mill. The data obtained on these samples were used as guides for the quality of stock desired for the operation of this particular newsprint machine. The pilot plant at the Savannah laboratory manufactured sufficient pulp for this commercial run. When this pulp was delivered to the mill and was made into newsprint, there was not a single break in the web throughout the entire run and the run was made at normal machine speed. Such successful operation demonstrates the value of control procedures now generally accepted by all newsprint mills.

The researches carried out at the Forest Products Laboratories of the United States and Canada, as well as in other research institutes, have continued their splendid assistance to technical men and, therefore, to the newsprint industry.

As we look forward, I confidently predict that my fellow members of the Technical Association of the Pulp and Paper Industry will continue to play an important role in the developments of the future.

Grinding the Beating Surfaces of the Standard Laboratory Beater

LOREN V. FORMAN[1] and DONALD D. NIEMEYER[2]

The procedure commonly used for grinding the tackle of the standard beater is described in TAPPI Standard T 200. The method specifies that the beater shall be charged with a pulp suspension containing 120-mesh emery dust, and that the bedplate shall be held against the roll until a good fit is obtained; the tackle is then considered adquately sharpened. It was observed that the method did not always reproduce the normal beating action and occasionally the tackle seemed to become dull. In 1940, The Institute of Paper Chemistry developed a technique which has given more dependable results. Instead of powdered emery, the principle sharpening effect is produced by grinding the tackle with a water suspension of sawdust. The details of the method and its advantages and limitations are discussed below.

The condition of the beating tackle is determined in the following manner: A portion of a bale of unbleached sulphite pulp is reserved as a reference standard. A representative sample of the standard pulp, obtained by boring, is evaluated by the beater method. At each interval of beating, Schopper freeness is determined and handsheets are made in accordance with TAPPI Standard T 205. After the beater has been used for a number of tests, the process is repeated. If a comparison of the data with the previous results shows a significant divergence, the beating tackle is reground. Whenever this divergence occurs, it implies that the beater evaluations preceding the calibration test are invalid.

The tackle of a beater is ground whenever:

1. A new bedplate is installed.
2. A new rubber diaphragm is required. (This applies primarily to the older models of the beater.)
3. The bedplate chatters excessively during the last portion of a regular beater test, indicating an improper fit of the roll on the bedplate or an unsymmetrical roll.
4. The beater does not give reasonable check results in the calibration tests.

Grinding with emery, according to the TAPPI Standard, precedes the sawdust treatment in each case except the fourth condition, in which the proper beating action is restored by grinding with sawdust only.

To obtain a high polish and, hence, a more stable condition on the surface of the bars, or to sharpen tackle that fits perfectly, the beater is ground with a suspension of sawdust in water. Before this is done, the standard pulp or lap pulp taken from the same bale is evaluated in the beater but only the freeness is determined. The beating time-freeness relationship is compared with that normally obtained on the standard pulp. The difference in the rate of beating, indicated by the rate of decrease in the freeness, serves as a guide in determining how much grinding with sawdust is required.

Twelve liters of water are placed in the beater, together with 500 grams of spruce sawdust which has been screened through an 8-mesh sieve. The suspension is circulated in the beater and the lever arm of the bedplate is loaded with a 6500-gram weight. A minimum amount of beating with a given charge of sawdust is 6 hours, whereas 10 to 12 hours are usually required. After the completion of the treatment that was selected, the sawdust, which is reduced to wood flour, is transferred to a container and the beating time-freeness relationship is again determined. If this test or a subsequent calibration test indicates that the beater requires additional grinding, the same charge of sawdust is returned to the beater and beating is continued up to about 18 hours, after which a fresh charge of sawdust and water is employed. This cycle may be repeated many times without materially eroding the bars except at the points which come in contact.

Experience with emery grinding alone or with emery grinding followed by grinding with sawdust has shown that the stability of the tackle condition is about the same for the two systems. The main advantage of grinding with sawdust is that the operation can be controlled and reproduced much more effectively than by grinding with 120-mesh emery. There is much less erosion of the roll knives and bedplate if sawdust is used. As a result, the life of the bedplate knives is greatly prolonged.

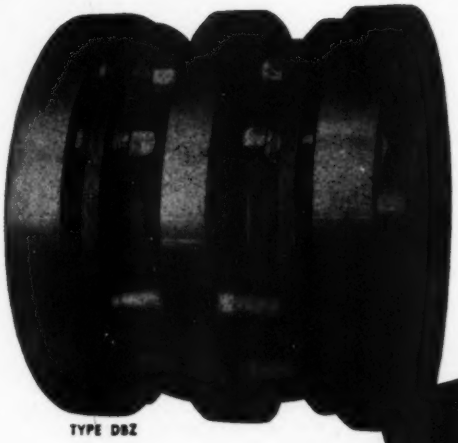
Although the period of grinding with sawdust is quite long it was found that the emery treatment consumed as much or more time, particularly if the emery grit dulled the tackle. Sawdust has never dulled the tackle. Grinding with sawdust sharpens the tackle or leaves it in the same condition if a short period of grinding is applied.

The procedure for grinding with sawdust should be regarded as a suggested method until more data are accumulated. The ultimate test can only be performed on beaters that are being used almost continuously, such as for routine pulp evaluations in control laboratories. Comments on the use of the method for maintenance of the calibration of a beater, under these and other operating conditions, are requested.

(1) Research Associate, (2) Research Assistant, The Institute of Paper Chemistry.

THOMAS *Flexible* COUPLINGS

. . . proven to be 100% dependable on wood choppers, centrifugal pumps and other heavy duty machinery in the paper manufacturing industry



TYPE DBZ

Today's modern high-speed paper manufacturing machinery requires couplings with all the important features built into the couplings designed by Thomas Engineers.

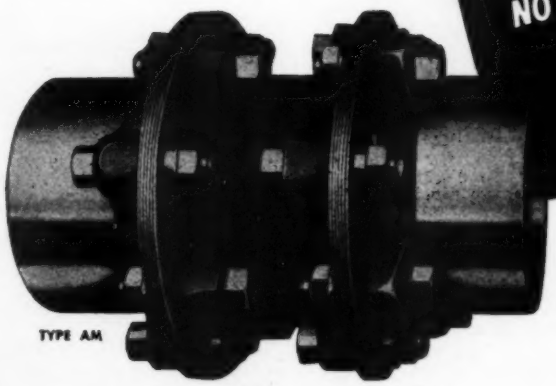
Thomas Couplings are in perfect balance under all conditions of misalignment.

BACKLASH, FRICTION, WEAR and CROSS-PULL ARE ELIMINATED

NO LUBRICATION IS REQUIRED!

Torsional characteristics remain constant regardless of length of service.

The Longer Life of Thomas Flexible Couplings, without costly interruptions and replacements will add much to Your Operating Profits!



TYPE AM

Thomas All-Metal Flexible Couplings do not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.

Write for our Complete Engineering Catalog!

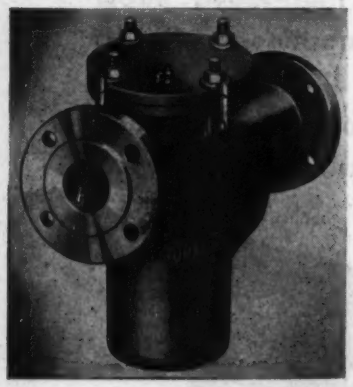
THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA

NEW EQUIPMENT AND SUPPLIES

Pressure and Suction Pipe Line Strainer

J. A. Zurn Mfg. Co., Erie, Pa., has announced a pressure and suction pipe line strainer for maintaining maximum liquid flow through piping systems while protecting pumps and moving parts of other equipment. The high pressure strainer has a removable drop-bolted cover; the low pressure strainer, a yoke clamp cover. On the cover is an air pressure relief valve.



The unit can be furnished with a magnetized strainer basket for intercepting ferrous metal particles too small to be intercepted by the strainer. The unit is also available with a cleanout plug for blow-down cleaning when practical.

The strainer basket perforations exceed the area of the opening of the inlet by more than a 1.5 ratio. The strainer basket is removable for cleaning.

Totally-Enclosed Fan-Cooled Motor

A totally-enclosed, fan-cooled motor especially designed for use in extremely dusty, dirty and corrosive atmosphere has been added to the Tri-Clad line of induction motors of General Electric Co., Schenectady, N. Y. The new motor is available in standard, explosion-proof, and dust-explosion-proof types from one to 1,000 hp. It features a double-shell, cast-iron frame, and cast-iron end shields and conduit box for protection from external blows, dripping water, dusts, vapors, and corrosive liquids. Sealed end shields and inside joints, and a one-piece, double-shell stator protect windings, punchings and rotating parts from moisture or corrosive elements. Long, close-running shaft fits, supplemented by a rotating seal, keep dirt from entering the motor along the shaft. Punchings and windings within the inner shell of the motor are cooled by a non-sparking external fan which is protected by a cast-iron housing with a screened air-intake opening.

The cast-iron bearing housings are cast integral with the end shields as a barrier to the entrance of foreign materials. An inner cast-iron bearing cap makes a complete enclosure for the bearing. A pressure-relief greasing system is used.

Low starting current, with balanced design, makes the motor suitable for full-voltage starting. The motor has high pull-up torque for snappy acceleration, and high maximum running torque to meet temporary abnormal peaks and low-voltage conditions.

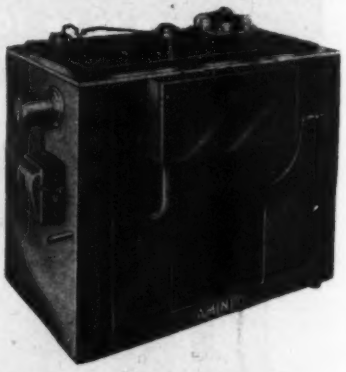
Flow Indicator

Builders-Providence, Inc. (Division of Builders Iron Foundry), 77 Codding Street, Providence, R. I., has announced a flow indicator, the *Flo-Gage*, for indicating the rate of flow of liquids and gases through lines containing orifices, venturi tubes and inserf nozzles as differential producers and also for indicating liquid level and pressure differences. The gauge can be furnished to measure such units as gallons per minute, cubic feet per hour, etc., and indicates rate of flow within two per cent of full scale. The gauge mechanism is enclosed in a heavy semisteel chamber having a thick prestressed glass window designed for an operating pressure of 500 psi.

"Climate Maker" For Laboratory

American Instrument Co., Silver Spring, Maryland, has announced the *Aminco Climatizer* for use in laboratory test chambers and small-size rooms as a means of producing a wide range of temperature and humidity conditions. The Climatizer can be used as an industrial unit for application to a test chamber in the customer's laboratory, or it can be supplied with a work chamber.

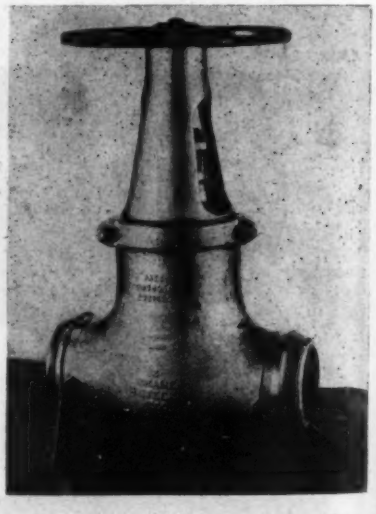
According to the manufacturer, extreme sensitivity and immediate response of the humidity controlling portion of the Climatizer are made possible by the use of highly sensitive controls.



The necessary amount of water in the Climatizer itself is maintained automatically. Heaters are totally enclosed in protective metal sheaths. A large section of the top of the Climatizer may be lifted off for inspection of interior.

Pressure-Seal Valve

Crane Co., 836 S. Michigan Avenue, Chicago 5, Ill., has announced a high-pressure, high-temperature steam service valve (primarily in the 1,500 lb. and 900 lb. pressure classes), with welding ends, and embracing gate, globe and angle, and automatic stop-check types. Among the features of this valve as covered by the announcement are the following:



A pressure-seal bonnet joint utilizes the pressure in the valve to seal the joint and to eliminate leakage.

Inspection of the interior of the valve is expedited by the ease with which the

ARMOUR'S ANIMAL GLUE

IS SURE EASY TO PREPARE

that's right, Mister...

You can use Armour's Animal Glue *without complicated chemical additions!* Merely mix with water, melt and use.

and that's not all...

Remember this about Armour's Animal Glue

Easy to prepare
Easy to use
Completely uniform
Pure, clean, clear
High jelly strength
Chemically inactive
Tough and pliable
Does not deteriorate

Important: At present, demand for many grades of Armour's Glue exceeds supply. However, we'll gladly discuss your problems to help you make *more efficient use* of the glue that is available.

Armour's Animal Glue has no impurities . . . It is commercially clean, clear, and one hundred per cent glue. This purity, plus high jelly strength, viscosity and tensile strength, means better sizing.

It's particularly good for beater and surface sizing . . . Chemically inactive on paper—no oxidizing, discoloring, flaking or shedding. It's grease-free . . . tough, pliable, light in color and clear . . . especially adaptable to top quality products.

It's absolutely uniform . . . The careful, scientific controls in making Armour's Animal Glue mean *complete* uniformity . . . help assure efficient, uninterrupted production in your plant.

Armour GLUE Division

MANUFACTURERS OF HIDE GLUE, BONE GLUE, FLEXIBLE GLUE, SOLUBLE DRIED BLOOD, BLOOD ALBUMIN

1355 WEST 31ST STREET • CHICAGO 9, ILLINOIS

Darnell Casters

made in all sizes in both swivel and stationary types

furnished with either semi-steel or rubber tread wheels

assure maximum floor protection and reduce wear on equipment

A SAVING AT EVERY TURN

DARNELL CORP LTD
LONG BEACH 4 CALIFORNIA
60 WALKER ST NEW YORK 13 N Y
36 N CLINTON CHICAGO 6 ILL

pressure-seal bonnet joint can be taken apart and reassembled.

Valve is easier to handle in erection because of appreciable reduction in weight.

Streamlined design makes for easier application of insulation.

A new design of disc for gate valve (Stellite-faced) eliminates sticking of the disc and requires less torque for opening when the valve is cold after having been closed while hot.

Disc guide insures proper guiding of the disc for the full length of its travel.

Body rings are seal-welded in place and Stellite faced. They permit straight line flow with minimum friction.

A simple clamp, in sizes 8 in. and larger, connects the yoke to the body. The yoke is made integral with the retaining ring in sizes 6 in. and smaller.

Magnetic Adjustable-Speed Drive

Electric Machinery Mfg. Company, Minneapolis 13, Minn., has announced a magnetic adjustable-speed drive consisting of only two operating parts; namely, a rotating ring and a rotating magnet.

Known as the new E-M Magnetic Adjustable-Speed Drive, the unit, an electro magnetic torque transmitter, is used in combination with a constant speed a-c motor and an electronic controller to provide split-revolution speed control.

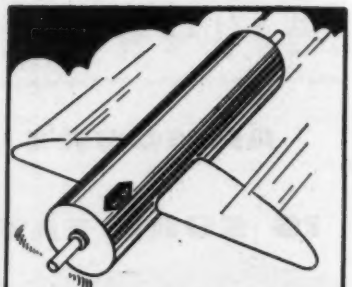
Available in several forms, the drive is built in ratings approximately 25 hp. and larger at 1800 to 600 rpm.

Synthetic Fatty Acid of Medium Titre

The Beacon Company, 97 Bickford St. Boston 30, Mass., has announced *Palmalene* as a new palm fatty acid of medium titre. A synthetically made product, Palmalene has the following specifications: saponification number, 180-185; iodine value, 55-60; titre, 35. It is supplied in 50, 200 and 400 lb. drums, in 10 lb. cans, and in 2 lb. laboratory containers.

Fog Fire Fighting Unit

Bowser, Inc., Fort Wayne, Ind., has announced a fog fire fighting unit for direct connection to a water line. The



FAST DELIVERY ON "SHAF-TITE" ROLLS

FOR WET FELTS

plus patented features that give greater value.

Write for Catalog!

RODNEY HUNT MACHINE COMPANY
Orange, Mass., U.S.A.

unit is built in two models, the only difference in them being that Model 1030 has a shorter hose and smaller cabinet than Model 1033 which has 100 feet of one-inch hose.

A swing-joint mounting on the wall

or a stand pipe makes it possible for the cabinet to revolve in alignment with the direction of the hose pull.

A valve actuating fixture holds the fog nozzle for instant use. The automatic valve releases the spray to full capacity upon removing the nozzle from the cabinet fixture.

In addition, to provide protection in instances where a flame is impossible to reach with fog, the unit also is equipped with a standard solid stream nozzle.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

Flexco HD Rip Plate

Flexco HD Belt Fastener

FLEXIBLE STEEL LACING CO.
4606 Lexington St., Chicago, Ill.

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

PERFORATED METAL
Green's
Precision perforations in all sizes for large production and screen durability
Copper • Steel
Monel • Stainless Steel
Chemical Resisting Alloys

The Harrington & King Perforating Co.
8654 Fillmore St., Chicago 44, Ill. 144 Liberty St., New York 6, N. Y.

Read . . .
THE PAPER INDUSTRY AND PAPER WORLD
for
Constructive Articles—Selected News—Features

TRIMBEY MACHINE WORKS
GLENS FALLS N.Y.
PULP SCREENS
WEIGHT AND CONSISTENCY REGULATORS
METERING SYSTEMS FLOAT VALVES

APPLETON FELTS

APPLETON WOOLEN MILLS
APPLETON · WISCONSIN

TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Decomposition Products in Waste Sulphite Liquor From Spruce

Loosely combined sulphurous acid in sulphite waste liquor is partially combined with sugars and particularly glucose and partially with the lignosulphonic acid The glucose bisulphite addition product is stable in acid solution and is present in an equilibrium. With increasing temperature or, with increasing pH, this glucose addition product is split, and according to Hägglund, causes the trouble often encountered when the waste liquor is neutralized. In the present paper, the behavior of this addition compound of glucose and of the loosely combined acid during neutralization was studied in detail, and the data are given in full. The equilibrium depended on the pH of the solution. With decreasing pH the velocity decreases but at pH 6 to 7, the speed is so rapid that the "combined" sulphurous acid can be titrated as free acid. In order to determine the equilibrium as it exists at the higher pH, the equilibrium was halted by rapid acidification and the free sulphurous acid was titrated immediatly. The organically bound sulphurous acid was then split off by means of alkali, the solution again acidified and the sulphurous acid rapidly titrated. The behavior of mannose and xylose bisulphite addition products was also studied. During the cook it is improbable that such compounds exist, but they seem to form on cooling, whereby an equilibrium is established. The results do not show whether or not the loosely combined sulphurous acid derivatives are exclusively those of the sugars. These compounds however do not cause the difficulties that are reported when the liquor is neutralized. Presumably more stable compounds (possibly those of lignosulphonic acids) are present. Ten references. T. Höpner. Cellulosechemie, 22, No. 3, 72-88 (1944) through B.I.P.C. 16, No. 9, 416 (1946).

Malayan Meranti Wood Used in Pulping

Four species of "meranti wood" (*Shorea sp*) were examined for production of kraft paper. The results indicate that all four woods lent themselves to pulping, and thus paper can be made from meranti wood thinnings. The yields are satisfactory and the pulps are moderately bleachable. Various types of printing and writing papers can be made, but for grades in which high strength and good opacity are required, the pulps are not suitable. On long beating, the resulting papers are rattly and highly transparent. Unbleached soda pulps from these thinnings, although inferior to commercial kraft pulps, could nevertheless be used for cheaper grades of wrapping paper.

From the economic standpoint however, meranti wood may not be too favorable a papermaking raw material. Malaya now has other more versatile cellulosic materials. The question of availabality, transportation, etc., would also have to be investigated. It would be difficult to operate a mill unless it had a moderately large capacity. Hence it would be necessary to examine the potential output of pulp and paper in relation to local consumption and potential markets for the grades that could be manufactured. E. L. Hill. Bulletin of the Imperial Institute 43, No. 4, 265-7A (1945) through Bull. Inst. Paper Chem. 16,420 (1946).

Sodium Bisulphite On Sprucewood

One kilo of sprucewood was digested with 5.5 liters of sodium bisulphite solution containing 1.45% sodium hydroxide and 11% total sulphurous acid. The temperature was 70 degrees and the cooking time was 12 hours. At the end of this period the liquor was drained off and the residual wood was recooked for 12 hours under the same conditions. After this cook, the wood was redigested again for 24 hours (twice), and subsequently for 36, 48, 72, and 75 hours, thus giving in all eight fractions of sulphite waste liquor. After these 303 hours of total cooking time (at 70 deg.) the residual pulp yield was 51.4%; the pulp retained 1.4% lignin. From the waste liquors a total of 293.3 grams ligno-sulphonic acid (1) was obtained, retaining 81.5% of the methoxyl originally present in the wood. A very thorough study was made of each separate waste liquor fraction. These are given in detail.

Thus, the carbon to sulphur ratios, the methoxyl to carbon ratios, and the methoxyl to sulphur ratios were all determined, as well as the phenolic hydroxyl content. A calculation of the carbon, hydrogen, methoxyl and the hydroxyl content of(I) on the sulphonic acid-free basis. The data agreed well with carefully prepared cuprammonium lignin. The results indicate that during the sulphonation at 70 degrees no benzofuran rings are split but that ether linkages may be split without the formation of new phenolic hydroxyl groups. K. Freudenberg, W. Lautsch, and G. Piazolo. Cellulosechemie 22, 97-102 (1944) through Bull Inst. Paper Chemistry 16, 393-4 (1946).

Tall Oil Size—A Substitute for Rosin

On distilling tall oil, the crystallized tall rosin acid gives a product that is equal to imported rosin as a sizing agent. The residual pitch from the tall oil, however, while it contains 50-60% rosin, presents difficulties in separation which make its isolation uneconomical. However, a sizing substitute ("tall oil size") may be prepared from the pitch (without rosin isolation). This size after dilution with water may be added directly to the beater without cooking. This size, besides containing rosin, also appears to retain about 20% of neutral substances, which seem to have some sizing effect. The sizing effect of 150-170 kg. of this (water-free) tall oil size is about equal to that of 100 kg. rosin. However, because of its dark color it cannot be used with bleached pulps. It serves its best purpose with sulphate and steamed mechanical pulps, but can also be used with unbleached sulphite and ordinary groundwood. V. V. Juvonen. Svensk Papperstidn. 49, Vol. 9 (1946); through B.I.P.C. 16, No 7, 313 (1946).

Wet Screening in the Paper Industry

The underlying theory and significance and limitations of wet screening are fully discussed, together with the relationship that exists between screening methods and the products obtained. The importance of finally arriving at clean-cut indices for judging the actual efficiency of a screening operation is emphasized.

Both quantitative and qualitative consideration must be given to the problem. The total quantitative performance is gauged by the charge (computed on the oven dry basis) that can be treated within a definite unit time. The specific efficiency of the screen is gauged by the amount of stock that contacts one square meter of screen surface within a given time. However efficient screening also depends on the separation of clean stock and removal of impurities. At present a quantitative evaluation of screening methods is possible only in the case of groundwood. The article is largely mathematical and is well illustrated. W. Brecht and H. Schröter. Papier-Fabr. Wochbl Papierfabr. (August, 1944), 259-68.

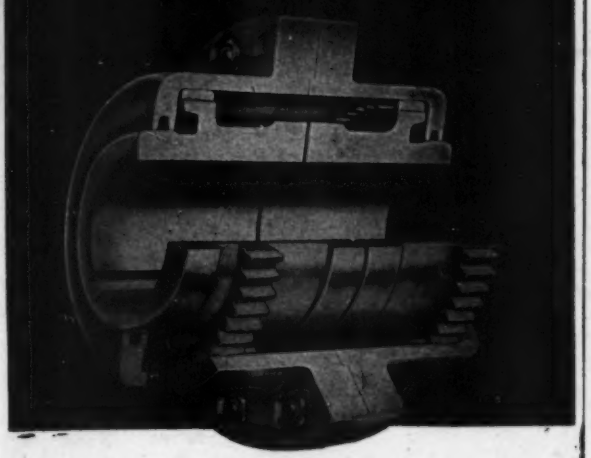
Mold Growth on Books and Paper

Based on their observation that there was no growth of fungi, when the relative humidity was kept below 75%, the authors recommend that the humidity in bookcases be controlled by the use of open-mesh bags of silica gel, ten grams of such a gel absorbing 5.93 grams of water vapor within eight days and thus becoming exhausted. S. L. Larnach and B. D. Wyke. Lab. J. Australia 3, 92-9 (1945) through C. A. 40, 1316 (1946).

The Nature of Wood Lignin

The authors bring further evidence that lignin is aromatic in nature and that this hypothesis is confirmed by ultraviolet absorption spectra. Aqueous extracts of Beechwood lignin show ultraviolet absorption spectra indicating aromatic nuclei. The carbon balance of beechwood also indicates that lignin is present in the form of an aromatic compound. K. Freudenberg. Cellulosechemie 22, 117 (1944).

POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

GEORGE F. HARDY

Consulting Engineer to the Paper Industry since 1900
441 Lexington Avenue, New York 17, N. Y.
MEMBER—AM. SOC. C. E.—AM. SOC. M. E.—ENG. INST. CAN.

Consultation	*Paper and Pulp Mills*
Reports	*Hydro-Electric and*
Valuations	*Steam Power Plants*
Estimates	*Plans and Specifications*

Specify High Capacity

PHILCO STORAGE BATTERIES
FOR YOUR ELECTRIC INDUSTRIAL TRUCKS

WATERBURY FELTS

are made by

H. Waterbury & Sons Co.

Oriskany, New York

Longer Service with Trentweld
STAINLESS TUBES

Highly resistent to the corrosive action of black liquor, Trentweld stainless tubes pay for themselves in the extra years of trouble-free service they provide. You can depend on these rugged, thin-walled heat exchanger tubes with a clear-cut record of success behind them, to deliver a more efficient transfer of heat, with less care or attention, for a longer time, at a lower net cost per tube. For full information, write Department 18.

TRENTWELD STAINLESS STEEL TUBES

Sales Office - 664 N. Michigan Ave.
Chicago, 11, Ill.

TRENT TUBE MFG. CO.

Mill at
East Troy, Wisconsin

PAPERMAKING PATENTS

IN THE UNITED STATES—Compiled by James Atkins, Registered Patent Attorney

Inquiries should be addressed to James Atkins, Munsey Building, Washington 4, D. C.

Paper Coating Device

Patent No. 2,369,378. William F. Thiele, Wisconsin Rapids, Wis., and Warren E. Beadle, Sr., deceased, late of Wisconsin Rapids, Wis., by Warren E. Beadle, Jr., administrator, Biron, Wis., assignors to Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., a corporation of Wisconsin. Original application May 31, 1939. Serial No. 277,460. Divided and this application January 10, 1942. Serial No. 426,320. 6 Claims. (Cl. 91—49).

1. A device for coating a paper web which comprises a rotating coating roll, means for controllably passing coating material in predetermined amount to the surface of said roll in the form of a film, an axially reciprocating roll disposed adjacent said coating roll and rotatable therewith with its surface in contact with the coating material upon the coating roll and positioned with respect to the coating roll to contact and smooth said coating material thereon after application thereto and render the film uniform in thickness before transfer to the web, and means for passing a paper web into contact with the film of coating material on the coating roll to transfer said film to the surface of the web.

Safety Paper

Patent No. 2,378,585. Adolf Schroth, Neu-Kalisz, Germany; vested in the Alien Property Custodian. No Drawing. Application December 15, 1937, Serial No. 180,047. In Germany December 23, 1936. 6 Claims. (Cl. 92—21).

3. A safety paper which contains a reducible salt selected from the group consisting of mercury tungstate, barium tellurite and barium selenite, and a compound selected from the group consisting of ammonium-iron-cyan-tungstate and ammonium-iron-cyan-molybdate.

Coating for Paper

Patent No. 2,374,862. Barrett K. Green, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio, a corporation of Maryland. Application June 19, 1942, Serial No. 447,681. 16 Claims. (Cl. 106—137).

1. A liquid emulsion having a continuous phase which is a solution of a solid in a drying liquid, said solid being rupturable by marking pressures and having a discontinuance phase of a low-polarity oily liquid containing a marking chemical.

Bearing Mount for Papermaking Machines

Patent No. 2,372,764. Everett W. Clem, Shrewsbury, and John P. Munton, Worcester, Mass., assignors to Rice Barton Corporation, Worcester, Mass., a corporation of Massachusetts. Application December 8, 1942. Serial No. 468,228. 7 Claims. (Cl. 92—44).

1. In a paper making machine having a roll carrying an open mesh screen on which a paper web is laid, a bearing mount supporting the roll comprising a base, a bearing housing mounted on and movable relative to the base, a flexible truss carried by the base and having a bowed portion supporting the housing, and means for varying the curvature of the truss and adjustably positioning the housing and the roll carried thereby.

Process of Manufacturing Paper and Board

Patent No. 2,368,635. Levis M. Booth, deceased, late of Plainfield, N. J., by Alice Lippincott Booth, executrix, Plainfield, N. J. Application May 11, 1939. Serial No. 273,136. 4 Claims. (Cl. 92—21).

4. In the art of making continuous web paper and paperboard, the method of effecting uniform distribution of fibers and the retention of fines in the stock deposited on the wire, which consists in introducing bentonite in colloidal form into the stock circulating system at a point subsequent to the beaters, where the consistency of the stock is less than 2%, and adding an acidifying substance to react with the bentonite present to enhance coagulation.

Apparatus for the Longitudinal Creeping of Webs of Paper Or Other Sheet Material

Patent No. 2,376,915. Rudolf Haas, Berlin-Zehlendorf, Germany; vested in the Alien Property Custodian. Application December 31, 1940, Serial No. 372,674. In Germany November 2, 1938. 11 Claims. (Cl. 154—30).

1. Apparatus for the longitudinal creping of webs of paper or other material capable of being creped, said apparatus comprising in combination: a rotatable grooved cylinder; creping tools adapted to move in the direction of travel of the web laterally to the latter along an oblique inwardly directed line; a fixed mantle surrounding said cylinder for pressing the web against the periphery of the cylinder, said mantle having edges tapering in the direction of travel of the web; and said creping tools adapted to move alongside the tapering edges of said mantle.

Papermaking Machine Press Roll Assembly

Patent No. 2,390,692. Everett W. Clem, Shrewsbury, and Gustaf E. Winter, Worcester, Mass., assignors to Rice Barton Corporation, Worcester, Mass., a corporation of Massachusetts. Application December 3, 1943. Serial No. 512,758. 5 Claims. (Cl. 92—49).

1. A paper making machine press roll assembly comprising a movable pressure roll and a second roll mounted in parallel axial arrangement with their axes near a horizontal plane for pressing a paper web therebetween, two separate levers pivoted below and carrying the opposite ends of the pressure roll, two separate springs, one associated with each lever and located below the pressure roll axis, which urge the pressure roll towards the other roll, means for leading an endless felt around and beneath the pressure roll, mechanism for independently adjusting the force applied by each of said springs, and mechanism associated therewith for adjusting the springs simultaneously and moving the levers in unison, said springs being so located that the pressure roll may be removed and the felt replaced without disassembling the springs and their adjustment mechanism.

Defibering of Wet Strength Paper

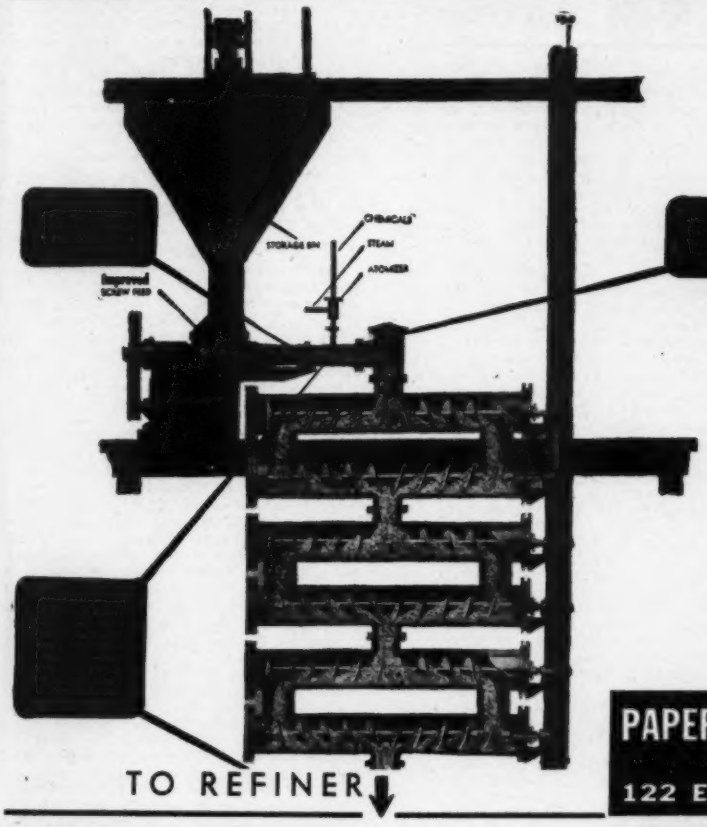
Patent No. 2,394,273. Walter M. Thomas, Stamford, Conn., assignor to American Cyanamid Company, New York, N. Y., a corporation of Maine. No drawing. Application April 1, 1942. Serial No. 437,207. 7 Claims. (Cl. 92—1.5).

1. A method of defibering paper impregnated with a cured acid-curing resin selected from the group consisting of melamine-aldehyde resins and urea and thiourea-aldehyde resins which comprises the steps of heating an acidified aqueous suspension of said paper containing acidic material sufficient to produce a pH of less than about 5 in a 0.6% suspension of the treated stock but not so strongly acid as to destroy the cellulose at elevated temperatures of about 100° F. to 212° F., subjecting the paper to mechanical disintegration and continuing the disintegration until the paper is defibered.

Method of and Means for Separating Solid Particles in Pulp Suspensions and the Like

Patent No. 2,377,524. Edward W. Samson and Alfred H. Croup, Erie, Pa., assignors to Hammermill Paper Company, Erie, Pa., a corporation of Pennsylvania. Application November 21, 1939, Serial No. 305,449. 20 Claims. (Cl. 92—28).

1. In apparatus for separating solid particles from liquid a centrifugal separating Chamber which comprises a short cylindrical portion having a diameter of between 2.0 and 4.2 inches and a long conical portion in axial alinement therewith and extending from the periphery thereof toward an apex, the length of the conical portion being between about five and fifteen times its greatest diameter, said cylindrical portion having an end closure member, an outlet tube having a diameter between one-eighth and one-quarter that of said cylindrical portion extending through said closure member and axially into said chamber, a continuously unobstructed outlet at the apex of said conical portion of approximately one-quarter the cross-sectional area of said outlet tube, and an inlet disposal tangentially of said cylindrical portion.



THE CHEMIPULPER

Patented and Patents Pending

For Continuous Production of Semi-Chemical Pulps

Through the use of the CHEMIPULPER, it is possible to produce fibres for the manufacture of: (1) insulating (soft) board, hard board; (2) roofing and flooring felts; (3) special fibres for industrial uses such as bulk insulation, plastics, etc., and (4) semi-chemical pulps for the manufacture of paper and paper board.

The fibres and semi-chemical pulps are produced from any specie of coniferous and deciduous wood, and the Chemipulper process is especially adapted to the utilization of wood waste, straw, bagasse, and other cellulosic materials.

The Reaction Chamber is made in units and the number of these can be varied according to the degree of treatment required. High pulp yield with low power consumption.

Bulletin upon request.

PAPER and INDUSTRIAL APPLIANCES
Incorporated
122 East 42nd Street, New York, N. Y.

Take A Look . . .

8 Publications for the Papermaker

Modern Pulp and Paper Making $7.25
G. S. Witham, Sr.
Second Edition, Revised and Enlarged. A book of 704 pages, written for machine tenders, beater men, and other practical mill workers, as well as for engineers, technologists and executives.

Trouble on the Paper Machine ..... .75
Archie McCaffery
A monograph—published in convenient pocket-sized edition. Bulk rates, in groups of ten or more, 50 cents per copy.

Pulp Bleaching (A Symposium) ..... .50

Technology of Papermaking Fibers ..... .50

Lessons in Paper Making—*Part 1* ..... .50
Harry Williamson

Lessons in Paper Making—*Part 2* ..... .50
Harry Williamson

Drying of Paper on the Machine 1.50
B. M. Baxter

Procedure Handbook of Arc Welding Design and Practice 1.50
Seventh Edition—latest information on all phases of arc welding—1308 pages—1810 illustrations. Standard text in hundreds of schools and colleges. ($2.00 outside U.S.)

Now available postpaid; mail check with order to

FRITZ PUBLICATIONS, INC.
59 E. Van Buren St., CHICAGO 5, ILL.

SERVING THE PAPER INDUSTRY

Right equipment — a better product at a lower cost. Look to Smith & Winchester's 118 years of leadership for the *right* equipment.

PAPER MAKING MACHINERY
PAPER BAG MACHINES
MODEL "E" UNDERCUT TRIMMER
JORDANS — FOURDRINIERS
WET AND CYLINDER MACHINES
ROTARY SPOT CUTTERS
REELS AND WINDERS
STUFF AND FAN PUMPS
ROLLS OF ALL KINDS

Bulletins furnished on request. We specialize on custom-built machinery to fit your particular needs.

The SMITH & WINCHESTER
Manufacturing Company
SOUTH WINDHAM, CONN.

New Catalogues and Publications

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—"Buying Guide of Allis-Chalmers Equipment for the Process Industries" is the title of an illustrated booklet which aims to help the reader make preliminary selection of industrial products. The booklet attempts to narrow the problem of purchasing such equipment as motors, motor controls, power generation and distribution equipment, vibrating screens, feeders, washing equipment, pumps, crushers, grinding and roller mills, pyro-processing machinery, blowers and compressors, V-belt drives, electronic heating and welding equipment. . . . Another recent publication is a letter-sized handbook which catalogues a wide variety of electrical equipment used in a number of industries. This handbook describes eight classifications of electrical equipment ranging from ½ 50,000 hp. a-c and d-c motors to eletronic heaters.

Betz, W. H. and L. D., Gillingham & Worth St., Philadelphia 24, Pa.—Outlined step by step in the pamphlet entitled, "The Six Fundamentals of Betz Water Conditioning Service," the procedure followed in attaining adequate boiler plant operation is described. The supervisory service offered by the Betz organization for boiler water conditioning is also treated.

Morse Boulger Destructor Co., New York, N. Y.—"The Martin Calcining Process for Lime Recovery" is the title of a newly published pamphlet. By using the Martin Calcining Process, the manufacturer claims that lime dust is eliminated and good soft burned lime is produced. The process is designed for the recovery of lime from the calcium carbonate sludges precipitated with some chemical processes used in water softening plants, paper pulp plants and beet sugar manufacturing plants.

Bulkley, Dunton Organization, Advertising Dept., 295 Madison Ave., New York 17, N. Y.—News items of interest to publishers, printers and other users of paper will be featured in the forthcoming issues of the *Pulp & Paper Bulletin.* This publication is the house organ of the Bulkley, Dunton Organization, but its popularity in the graphic arts trade has induced sponsors of the Bulletin to extend its services. Feature issues will be sponsored by three affiliated companies: Bulkley, Dunton & Co., Inc.; Bulkley, Dunton Pulp Co., and Bulkley, Dunton Paper Co., S. A. One of the most popular of the publications articles will be a series of features on pulp and paper mills. In order to be placed on the Bulletin mailing list, write to the company at the address given in this item.

B. F. Goodrich Co., Akron, Ohio — A new folder on the line of power transmission belting for drives manufactured by the Goodrich company has just been published. The pamphlet illustrates and describes the flat and V-belts used for various services. Sheaves, belt dressings, and the Flylock method of making transmission belts endure on the job are also described.

Ingersoll-Rand Co., Phillipsburg, N. J. —A bulletin of interest to many industries has been released by this company. The catalogue is entitled, "Two Stage Centrifugal Pumps." The pumps are illustrated with cutaway views of the types of drives, and typical illustrations; there are performance charts; dimensions and pipe friction, and typical pumping problems worked out. The pumps are for use in chemical plants, paper mills, packing plants, refineries, and many allied industries.

Jessop Steel Co., Washington, Pa.—In a booklet recently released by this company, the Type "R" composite tool steel manufactured by it is catalogued as to size of assemblies used to meet most requirements, the selection of correct backing steel, the proper design of bevel, and standard tool steel assemblies, as well as cost features of the assemblies.

Hercules Powder Company, Wilmington, Del.—A revised edition of the technical reference booklet on cellulose acetate has just been issued. Revisions of the ethyl cellulose and nitrocellulose booklets were published several months ago, and are still availble. Included in the revised endition is a new section on the use of cellulose acetate in thermoplastic laminates. The booklet also discusses the improved dimensional stability and greater water resistance of plastics made from high acetyl acetate. Other uses of Hercules acetate in rayon, film and foil, as well as specialty lacquers, are suggested. Also included are tables and figures. The tables include data on properties of cellulose acetate, solvents useful with cellulose acetate, compatibility of resins with cellulose acetate, starting formulas for specialty lacquers and properties of cellulose acetate plastics and laminates. The figures show the results of tests on clarity of cellulose acetate plastics, the solubility of low viscosity celluose acetate, and incude a blending chart, viscosity concentration curves, results of water resistance tests on high acetyl acetates, and other technical data of interest in the many applications for cellulose acetate.

The Permutit Co., 330 W. 42nd St., New York 18, N. Y.—A new bulletin has been issued on the pre-formed flock type condensate oil removal filters. The advantage of this type of filter over the older type of granular bed filters with separate alum and alkali feeds is described. The bulletin also gives details on the operation of rake agitator, and rotary surface units. . . . Another recent publication of Permutit describes the master valve control used for gravity pressure filters and zeolite softeners. Automatic control made possible through the use of a master valve, regulates rate of flow, prevents waste water in the operation of backwashing and rinsing, and maintains the zeolite of sand bed in clean active condition. This installation is well suited for water treatment plants.

Joseph T. Ryerson and Son, Inc., Box 8000-A, Chicago 80, Ill.—This company has been appointed distributor for the B & W Electric Resistance Welded Boiler Tubes. Arrangements have been completed with the Babcock and Wilcox Tube Co., and Ryerson will be the major warehouse outlet for the B & W welded pressure tubes. A bulletin has been published which outlines Ryerson's B & W boiler tube service. Copies may be obtained by writing to the Ryerson company.

Selas Corporation of America, Scientific Equip. Div., Erie Ave. & D Sts., Philadelphia 34, Pa.—Complete information on the Micro-Porous-Porcelain Filter Media has been published in a new 32-page catalogue. The filter media have many uses in laboratory applications and production work in other fields. The catalogue contains illustrations, porosity charts, flow rate tables, and suggested applications, as well as price schedules.

Whiting Corporation, Harvey, Ill.—Four new booklets have been added to the list of publications extended as part of Whiting's service to industry. Bulletin FY-140, "Useful Information for Foundrymen," is a revision of a former publication which contains tables and data. Bulletin FY-139, "How to Get Uniformity in Hot Metal," is an illustrated and chart data booklet which describes the economies of using cradle furnace as a ready source of uniform hot metal. Bulletin FY-141, "Presenting the Pour-Rite Ladle," outlines the advantages of using Pour-Rite Ladles which features the air-cooled trunnion. "Crane Maintenance Cost Record" is a record prepared for the entering of figures from maintenance work orders, time, or material tickets. By use of this reference it can be determined which cranes are paying their way.

Books

Glycerin—Its Industrial and Commercial Applications—Written by Georgia Leffingwell and M. A. Lesser, this book presents a digested and indicative review of actual and potential glycerin uses in a variety of industrial fields. Opening with a brief history of glycerin, the book proceeds to take up the various fields, chapter by chapter. Among the 30 chapters of the book, just to mention a few of them, are the following: Adhesives and Cements, Electrical Equipment, Lubricants, Metals, Packaging Materials, Paper Plastics, Printing and Lithography, and Paints and Protective Coatings. The book devotes one chapter to listing 1583 uses of glycerine and closes with an appendix made up of a table and several charts revealing properties of glycerin. Published by Chemical Publishing Co., Inc., 234 King Street, Brooklyn 31, N. Y., the book is priced at $5.00 a copy.

The History of The Hoffman Paper Mills in Maryland—Written and published by (Mrs.) May A. Seitz, 30 West Chesapeake Ave., Towson 4, Maryland, this book of a little more than 60 pages relates the contributions of William Hoffman, a German immigrant, and his descendants to the industrial development, and specifically the papermaking industry, of Maryland. The Hoffmans who had no connection with the paper industry do not fall within realm of the author's interest. Just as indicated by the title, the text covers the story of the Hoffman paper mills which began in 1775 and lasted for more than a century. Some few illustrations, an appendix, and a bibliography complete the book. Its price is $2.00 a copy.

Statistical Abstract of the United States (1944-45)—Bound in buckram, priced at $1.75 a copy, and for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., this reference volume totals more than 1,000 pages. Its contents includes statistical information on area and population; vital statistics; crime and criminals; immigration, emigration, and citizenship; labor force, military and civil services; social security and related programs; education; elections; national government finances; state and local government finances and employment; banking and finance; income and expenditures; prices; communication systems (including postal service); power, public roads and motor vehicles; transportation, air and land—steam and electric railways, express companies, motor buses, and civil aeronautics; waterways, water traffic; and shipping; foreign commerce of the United States; commerce of territories and possessions; irrigation and drainage; farms —general statistics; farm production and related statistics; farm animals and animal products; farm crops and foodstuffs; forests and forest products; fisheries; mining and mineral products; manufactures; distribution and services; construction and housing; climate; and public lands. The volume was prepared under the supervision of Morris H. Hansen, Statistical Assistant to the Director of the Bureau of the Census, and was edited by Kathleen H. Dugan.

MONO-PLANE weave

APP-WELD PATENTED SEAMLESS JOINT

APPLETON PHOSALOY WIRES THE STANDARD OF QUALITY

= Appleton Wires are Good Wires

APPLETON WIRE WORKS, INC. APPLETON, WIS.

New! a visual aid allowing group participation!

IT'S THE SAFETYGRAPH

What news! A visual aid that's ready for action all the time. No special costly equipment, nothing to do but set up the easel, turn the pages, and give the convincing, fast-moving safety talk printed on the back of each page.

What a subject! Safetygraph No. 1 is devoted entirely to "HOW TO LIFT." Every phase of lifting and handling objects is thoroughly covered.

What an idea! The 18 x 24-inch Safetygraph has 16 instructive pages of attention-getting photographs and cartoons emphasizing lifting do's and don't.

What a feature! Permits group participation in on-the-spot discussions. Workers can ask questions, offer suggestions, and tell their accident experiences without fear of disrupting the meeting. Next time you hold a safety meeting, make it a Safetygraph Meeting!

Write today! For complete details and prices address: Dept. DW-1.

Spiral Bound Pages Turn Easily—Lay Flat

NATIONAL SAFETY COUNCIL, Inc.

20 North Wacker Drive — Chicago 6, Illinois

CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

OPA ceiling prices in sales to consuming mills delivered buyer's usual receiving point, with brokers' allowance not in excess of 5 per cent.

	per cwt.
Blue Overalls	–5.50
Corduroy, Men's	–3.50
Corduroy, Ladies'	–3.00
Washables, No. 1	–3.00
Percales	–4.75
New Soft Blacks	–3.75
Light Prints, No. 1	–4.50
Khaki Cuttings—	
Bleachable	–4.25
Unbleachable	–3.50
New White Canvas	–6.50
New Mixed Blacks	–3.25
Canton Flannels, Bleached	–7.00
Shirt Cuttings—	
New White No. 1	–7.25
No. 1 White Headings	–7.25
White Shrunk	–5.00
Silesias No. 1	–5.75
New Unbleached	–7.50
Fancy	–3.50
Linen Cuttings—	
American	–5.00
White	–14.00
Grey	–14.00

RAGS (Domestic)

f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowance of $1 to $2 a ton depending on the value of the grade involved.

Bagging	per ton
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
White, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shapperies	

ROPE and BAGGING

f. o. b. and ex dock New York City

Gunny No. 1—	per cwt.
Foreign	Nominal
Domestic	$4.25 to 4.50
Wool Tares—	per cwt.
Light	4.25 to 4.50
Heavy	4.50 to 4.75
No. 1 Scrap Bagging	3.75 to 4.00
Manila Rope—	
No. 1 large	–*115.00
No. 1 small	–*105.00
Sisal Rope—	
No. 1 large	–*95.00
No. 1 small	–*90.00
New Burlap Cuttings	5.75 to 6.00
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
No. 1 sisal	–*89.00
No. 2 sisal	–*60.00
Soft jute	5.00 to 5.50
Mixed	2.00 to 2.25

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices f. o. b. points of shipment for machine compressed bales weighing not less than 500 pounds (with differential of $5 per ton less on certain grades for loose or bundled stock), plus $2.00 per ton loading charge, and brokers' allowance of 4 to 9 per cent.

Shavings—	per ton
White Env. Cuts, One-Cut	67.50–
Hard White Env. Cuts	62.50–
Hard White, No. 1	57.50–
Soft White, No. 1	56.00–
Soft White, One-Cut	57.50–
Soft White, Misc.	43.00–
Fly Leaf, No. 1	33.50–
Fly Leaf, Woody, No. 1	23.00–
No. 2 Mixed Col. Woody	18.00–
Flat Stock—	
No. 1 Heavy Books and Magazines	38.50–
Mixed Books	22.00–
Ledger Stock—	
No. 1 White	46.00–
No. 1 Mixed (Colored)	40.00–
Manilas—	
New Env. Cuttings	53.00–
New Env. Cuts, One-Cut	57.50–
Extra Manilas	39.00–
Manila Tab Cards, Free of Ground Wood	45.00–
Ground Wood Manila Tab Cards	27.00–
Kraft—	
Envelope Cuttings	65.00–
Mixed Env. or Bag Cuts	55.00–
Tripled Sorted No. 1 Brown	50.00–
New 100% Cor. Cuts	45.00–
No. 1 Old Assorted	35.00–
News—	
White Blank	33.00–
Overissue	22.00–
No. 1 Baled	20.00–
Old Corrugated Containers	25.00–
New Corrugated Cuts	18.00–
Mill Wrappers	22.00–
Box Board Chips	14.50–
No. 1 Mixed Paper	19.00–

CHEMICALS

f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25–
Ground, cwt.	4.00–
Powdered, cwt.	4.40–
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to —
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)	
28-30 mesh (bags), lb.	35.00 to 38.75
80-100 mesh (bags), lb.	—
Argentine, lb.	42.00 to 48.00
China Clay—	
Domestic Filler Bulk (mine) ton	3.00 to 15.00
Domestic Coating Bulk (mine) ton	12.00 to 22.00
Imported (ship side) Bulk (lump) ton	22.00 to 35.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	21.00 to 21.25
Litharge, powd., bbll, lb.	.11 to .12
Rosin (Gum)—	
New York, per 100 lbs.	
E	7.42–
F	7.42–
G	7.42–
WW	7.82–
Rosin (Wood), carlots	6.50–
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	20.00 to —
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.25
Barrels, cwt	1.05 to 1.25
Soda (Caustic)—	
Solid, drums, cwt.	2.30–
Ground and flake, drums, cwt.	2.70 to 2.95
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.45 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.72–
Pearl, barrels, cwt.	3.83–
Paper (Sp.) bags, cwt.	3.83–
barrels, cwt.	3.92–
Sulphur (Crude) (Mine) bulk, long ton	16.00 to —
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 25.00
Canadian	24.00 to 30.00
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	8.25 to 8.50

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo. (West of the Continental Divide and in Denver, Colo., ceilings are $6 per ton lower):

Bleached softwood sulphite	94.00
Unbleached softwood sulphite	82.00
Bleached hardwood sulphite	91.50
Unbleached hardwood sulphite	79.50
Northern bleached sulphate	94.00
Southern bleached sulphate	88.00
Northern semi-bleached sulphate	89.00
Southern semi-bleached sulphate	83.00
Northern unbleached sulphate	76.00
Southern unbleached sulphate	69.50
Bleached soda	84.00
Unbleached soda	80.00
Ground wood pulp	88.00
Ground wood—paper machine dried and mutilated	61.00
Sulphite screenings	45.50
Sulphate screenings	40.00
Ground wood screenings	34.00
Northern unbleached sulphate sideruns	76.00
Southern unbleached sulphate sideruns	69.50
Standard news print sideruns	58.00

PAPER

f. o. b. New York City

Boards—	per ton
Binders	90.00–
Chip	54.00–
Chip, tube and can	56.00–
Chip, full-blending	58.50–
Chip, sgl. mla. lined	65.00–
Coated, white patent .010	84.00–
.020 and heavier	79.00–
Kraft liner	74.00–
News	54.00–
Container	54.00 to 58.50

Book Papers—OPA base maximum prices per cwt. 4 cases or equivalent, f. o. b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	9.25
B Grade E. F.	8.85
C Grade E. F.	8.55
D Grade E. F.	8.25
No. 2 Uncoated Offset 4 sides. White	9.45

Coated White (Trimmed 4 sides)

No. 1 Glossy	12.65
No. 2 Glossy	12.40
No. 3 Glossy	11.60
No. 4 Glossy	11.15
C2S Offset	10.40
C1S Lithe (Varnish)	10.00
C1S Lithe (Non-Varnish)	9.80

Writing Papers—OPA base maximum prices per cwt. on writing papers, f. o. b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—	per cwt. 20 lb.	16 lb.
Extra 100% Rag	34.00	34.00
100% Rag	28.00	28.00
75% Rag	20.00	20.00
50% Rag	16.00	17.25
25% Rag	14.00	15.00

Rag Content Ledger—	per cwt. Zone 1
Extra 100% Rag	35.00
100% Rag	29.00
75% Rag	24.00
50% Rag	21.00
25% Rag	17.00
	15.00

Sulphite Bond—	per cwt. 20 lb.	16 lb.
Air dry, watermarked	12.75	13.70
No. 1 (M.F.) watermarked	9.00	9.70
No. 2 (M.F.) watermarked	8.25	8.85
Plain (M.F.) unwatermarked	7.60	8.20

Sulphite Ledger—	per cwt. Zone 1
No. 1 (M.F.) watermarked	10.00
No. 2 (M.F.) watermarked	8.25
Plain (M.F.) unwatermarked	7.60

Glassine (f. o. b. mill)—	per cwt.
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleached (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleached (25 lb. up)	11.00 to 11.50
Unbleached (25 lb. up)	10.00 to 10.50

News—OPA Ceilings—	per ton
Rolls, Standard (Contract)	73.80
Rolls (Spot)	(Nominal)
Sheets	

Tissues (Carlots)—	per ream
White, No. 1	1.12½ to 1.20
White, No. 2	.90 to 1.00
Bleached Anti-Tarnish	1.15 to 1.20
Colored	—
Anti-Tarnish Kraft	.70–
Manila	.80 to .85
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.60–
Napkins, full crepe and emb'sed (12½ lb to M shts.) per cs.	.60–
Toilet, Bleached (M shts.) per cs.	5.05
Toilet, Unbleached (M shts.) per cs.	4.25–

Towels—	per case
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.05

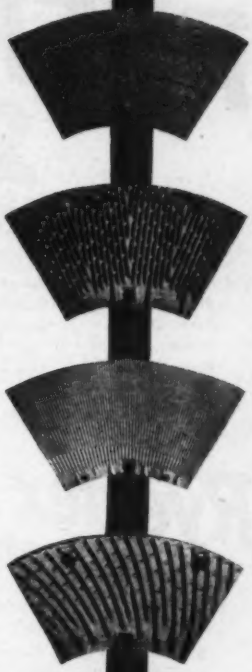
Wrappings (Kraft)—	per cwt.
Super-Standard	5.25 to 7.65
No. 1 Wrapping	5.00 to 7.00
Standard Wrapping	4.75 to 7.35
Standard Bag	4.37½
Variety Bag	4.62½–

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)

Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 50 lb.	5.50 to 5.75

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.50
Envy. Mla., Sub. 16-28 (No. 2)	5.75 to 6.00
Envy. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M.G. Sulphite and Kraft (other than Waxing)	
Grade B-30 lb.	6.75 to 7.00
Grade A-22 lb.	7.50 to 7.75

Bauer PULPER SALES SHOW GAIN OF 154%



These days such an increase in itself may mean little — until we add that repeat orders from satisfied users account for much of that increase.

Five Bauers to mills making toilet tissue; *Ten* Bauers to mills running rotogravure, book and other fine papers — also newsprint. *Several* Bauers for another mill group running a wide variety of grades.

Still other Bauers for other large mills or mill chains.

Therein you have a true measure of acceptance of the Bauer Pulper for fast, efficient and economical pulping of a wide range of stocks, reject salvaging, etc. Two sizes. Full range of plate patterns. Further information, with technical data, furnished on request.

THE BAUER BROS. CO.
SPRINGFIELD, OHIO

WHERE A QUICK OPENING VALVE IS NEEDED . . . .

Murco QUICK OPENING GATE VALVE

FOR any place where low pressure valves are required, especially for handling pulp and paper stock and water under low pressure, the Murco Quick Opening Gate Valve can be opened in a fraction of the time required to open a screw type valve. Easily cleaned . . . slide can be held in four positions . . . easily removed from valve without disconnecting valve from the pipeline—simply remove the bolts holding the bonnet to the body of the valve. Practically free from maintenance as there are no threads on the operating part of stem to wear out, and the gate cannot come loose from the stem. Available in all cast iron, cast iron with bronze slides, and all bronze, with plain flanges or drilled for spiral bevel pipe. Complete details upon request.

D. J. MURRAY MANUFACTURING CO.
WAUSAU WISCONSIN

SPRAY NOZZLES
to speed-up . . . improve mill operations

In every handling and processing operation from log to finished paper, wherever spray nozzles are used, Spraying Systems Spray Nozzles can offer important advantages. Design is based on advanced hydraulic engineering; a wide range of sizes is available in every basic nozzle type. As a result, spray nozzles can be selected to meet exactly every operating specification. Catalog No. 22 gives complete information. Write for your copy.

SPRAYING SYSTEMS CO.
4021-G West Lake Street Chicago 24, Illinois
SPECIALISTS IN SPRAY NOZZLE DESIGN AND MANUFACTURE
In Canada: John Brooks & Company, Montreal

RYERSON STEEL

IN STOCK for prompt shipment—Call your nearest Ryerson dealer.

Partial list of Ryerson products:

Alloy Steels	Boiler Fittings	Threaded Rods
Bars—Shapes	Reinforcing	Rivets—Nuts
Structurals	Floor Plate	Chain—Wire
Rails—Plates	Tool Steel	Tubing
Sheets—Strip		
Shafting—Bolts		
Stainless		

Large stocks in a complete range of sizes and analyses. Write for a current Ryerson Stock List.

Ryertex Bearings Laminated Plastic

Ideal for suction box covers, suction pipe covers, forming boards, doctor blades, and all types of water, oil or grease lubricated bearings. Write for details on any specific bearing application.

Joseph T. Ryerson & Son, Inc., Steel-Service Plants: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston.

CHEMIPULP PROCESS INC.

CHEMICAL PULP MILL ENGINEERS

500 Woolworth Building, Watertown, N. Y. — 3311 First Avenue South, Seattle, Wash.

Associated with CHEMIPULP PROCESS LIMITED, Montreal, Que.

CARTHAGE MACHINE CO.

• • •

CARTHAGE, NEW YORK

Machinery for Ground Wood and Chemical Pulp Mills.

HARDY S. FERGUSON & COMPANY

CONSULTING ENGINEERS

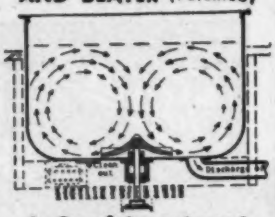
200 FIFTH AVENUE — NEW YORK 10, N. Y.

Hardy S. Ferguson—Member A.S.C.E. A.S.M.E. E.I.C.
Moses H. Tenzo—Member A.S.C.E A.S.M.E. E.I.C.

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

- PULP AND PAPER MILLS AND OTHER INDUSTRIAL PLANTS
- STEAM AND HYDRO-ELECTRIC POWER PLANTS
- DAMS AND OTHER HYDRAULIC STRUCTURES

APMEW BALE PULPER AND BEATER (Patented)



A Good Investment
which in many Paper Mills returns its cost two times every year.

APMEW LARGE ADVERTISEMENT in Paper and Pulp Mill Catalogue, may be on your desk.

Request information which may result in GOOD EARNINGS to you.

Pulp Screens
Knotters and Coarse Screens
Agitators for Chests
Beaters and Pulpers
Pulp Thickeners
Proportioning and Metering Systems

AMERICAN PAPER MACHINERY AND ENGINEERING WORKS, INC.
P. O. Box 1, Glen Falls, N. Y.

BIRK & CHOPORIS

CONSULTING ENGINEERS
30 NORTH LASALLE STREET
CHICAGO 2, ILLINOIS
PAPER MILLS POWER PLANTS
MEMBERS A.S.M.E. E.S.D.

MISCO "C"

THE CORROSION RESISTANT ALLOY

CAST • ROLLED • FABRICATED
for all equipment exposed to corrosion by sulphite acids
MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

MACHINERY FOR SALE

Complete solid fibre paster up to 4 plys 62" wide with or without paper lining stations; Miehle 46" printers and die cutters; Seybold 28"x38" heated embosser; International window cello. Gluer model CC; 36"&48" rotary printers; Waldron 64" rewinder; 63" and 76" Langston cut-off knives; 48" Meisel spot sheeter with Erie layboy; 64" Hamblet sheeter; 62" Beloit board sheeter; 72" and 96" hand board cutters; Sheridan 44"x64" and 80"x70" 4-post die cutters; Hayssen heat seal wrappers; S.A.M. folding box gluer; 45" and 120" Rotary Board Slitters. Also coaters, waxers, embossers, paper cutters, printers, gummers, gluers, creasers, scorers, trimmers, slitters and rewinders, slotters, die cutters, and stitchers. Write for bulletins listing over 70 paper converting and paper box machine now available. South Wabash Engineering Co., 2929 S. Wabash Ave., Chicago 16, Ill.

FOR SALE—One Erie Ball Variable Speed Steam Engine, size 14" x 14" x 16", operating at 150 lb. steam pressure against 25 lb. back pressure. Range 60 IHP at 45 RPM—190 IHP at 202 RPM. Engine complete with P.I.V. Variable Speed Regulator—Gravity Feed Cir. System—Pickering Flyball Governor and Safety Trip—MFF Lubricator. Engine Flywheel 6'0" dia. x 24-3/4" wide. All in good condition and has operated with a minimum of maintenance. Write Morris Paper Mills, Morris, Illinois, for price and further details if required.

WANTED—Chemist for research department of major producer of heavy chemicals in metropolitan Detroit. Position requires a man of research caliber with good background of education and some experience in inorganic chemistry including special knowledge of paper chemistry with emphasis on paper coatings. Opportunity for fundamental research and practical application of results. Reply in full indicating salary requirement and include recent photograph. Applications will be held in confidence. Address Box 421, Fritz Publications, Inc.

Index to Advertisers

When writing them, please mention The Paper Industry and Paper World

Refer to the Paper and Pulp Mill Catalogue and Engineering Handbook at your mill office, for complete listing of all advertisers' products.

Adams Co., Inc., R. P.
Allis-Chalmers Mfg. Co.
American Car & Foundry Co.
American Cyanamid & Chemical Corporation 667
American Defibrator, Inc.
American Hoist & Derrick Co.
American Paper Machinery & Engr. Works, Inc. 736
American Resinous Chemicals Corp.
Appleton Machine Co., The
Appleton Wire Works, Inc. 733
Appleton Woolen Mills 727
Armour and Company 725
Armstrong Machine Works 719
Asten-Hill Mfg. Co. 708
Atkins and Company, E. C.
Atlantic Steel Corp.
Aurand Mfg. & Equipment Co.
Aurora Pump Company
Bagley & Sewall Co., The
Bailey Meter Company
Baldwin-Duckworth Div. of Chain Belt Company
Bauer Bros. Co., The 735
Becco Sales Corporation 621
Beloit Iron Works 603
Binney & Smith Co. 669
Bird Machine Company
Birk & Choporis 736
Black-Clawson Co., The 677
Bowser, Incorporated
Bowsher Co., The N. P. 718
Brown Instrument Co., The
Buffalo Forge Company
Buffalo Pumps, Inc.
Calco Chemical Division, American Cyanamid Company 612
Cambridge Instrument Co., Inc. 666
Cameron Machine Co. 702
Carbonite Metal Co., Ltd.
Carthage Machine Co. 736
Cash Company, A. W.
Chain Belt Company
Chamberlain Engineering Corp.
Chemipulp Process, Inc. 736
Chicago Bridge & Iron Co. 632
Chicago Electric Company 670
Chromium Corp. of America
Clark Tructractor Division of Clark Equipment Company
Classified Advertising 736
Clayton Manufacturing Co.
Cleveland Tramrail Div., The Cleveland Crane & Engineering Co. 701
Columbia Chemical Division 605
Columbian Carbon Company
Columbian Carbon Company, Magnetic Pigment Division 669
Cooper Alloy Foundry Co., The
Crane Co. 703
Darnell Corporation, Ltd. 726
Davis and Thompson Co. 714
De Laval Steam Turbine Co. 715
DeZurik Shower Company
Diamond Alkali Company 642
Dilts Machine Works 677
Dodge Manufacturing Corporation 717
Dow Chemical Co., The 647
Downingtown Mfg. Co. 4th Cover
Draper Brothers Company 644
Dresser Industries, Inc. 676
du Pont de Nemours & Co., E. I. 608
Duriron Co., Inc., The
Eastern Stainless Steel Corp. 641
Eastwood-Nealley Corporation 704
Economy Co., Inc.
Electric Machinery Mfg. Co. 606
Electric Steel Foundry 650
Elwell-Parker Electric Co., The
English China Clays Sales Corp. 710
Fairbanks, Morse & Co. 685
Falk Corporation, The
Ferguson & Co., Hardy S. 736
Fitchburg Screen Plate Co., Inc.
Fleischel Lumber Company 624
Flexible Steel Lacing Co. 727
Flori Pipe Company
Foxboro Company, The
Fritz Publications, Inc. 731, 738
Garlock Packing Co., The
Gates Rubber Company 699
General American Transportation Corporation
General Chemical Company 635
General Electric Company 636-637
Glidden Company, The
Goslin-Birmingham Mfg. Co., Inc.
Goulds Pumps, Inc.
Grinnell Company, Inc. 613
Groch Engineering Co.
Gruendler Crusher & Pulverizer Co.
Hanchett Manufacturing Co. 700
Hardy, George F. 729
Harper Company, The H. M. 669
Harrington & King Perforating Co. 727
Harris-Seybold Company 2nd Cover
Hermann Mfg. Co., The
Hooker Electrochemical Co.
Hooper & Sons Co., Wm. E. 697
Hudson-Sharp Machine Company 720
Hunt Machine Co., Rodney 726
Huyck & Sons, F. C. 634
Hyster Company
Improved Paper Machinery Corp.
Ingersoll-Rand Company
Ingersoll Steel & Disc Div., Borg-Warner Corporation
International Nickel Co., Inc. 646
Jeffrey Mfg. Co., The
Jenkins Bros. 645
Johnson Corporation, The 707
Jones & Sons Company, E. D. 713
Jones Foundry & Machine Co., W. A.
Kalamazoo Tank & Silo Co. 694
Kalamazoo Vegetable Parchment Co.
Kelco Company 695
Kohler System Co., The
Koppers Company, Inc., Bartlett-Hayward Division 609
Langston Co., Samuel C. 3rd Cover
Layne & Bowler, Inc. 668
Lewellen Manufacturing Co.
Lindsay Wire Weaving Co., The 694
Link-Belt Company
Lockport Felt Company 716
Lodding Engineering Corp. 683
Lunkenheimer Co., The 688
Magnetic Pigment Division, Columbian Carbon Company 669
Magnus Chemical Co., Inc.
Mason-Neilan Regulator Co. 705
Mathieson Alkali Works, Inc.
Michigan Steel Casting Co. 736
Midwest Piping & Supply Co., Inc. 625
Miller Wrapping & Sealing Machine Company
Minnesota Mining & Mfg. Co.
Monsanto Chemical Company 627
Morey Paper Mill Supply Co.
Morley Co., The
Mt. Vernon-Woodberry Mills, Inc.
Murray Mfg. Co., D. J. 735
Nash Engineering Co., The 708
National Bearing Division, American Brake Shoe Company 611
National Oil Products Co. 687
National Publishers Assn., Inc.
National Research Bureau, Inc.
National Safety Council, Inc. 733
Naylor Pipe Company
Nichols Engr. & Research Corp.
Norma-Hoffmann Bearings Corp.
Northern Engineering Works 610
Northwest Engineering Co.
Norton Company
Norwood Engineering Co., The
Oakite Products, Inc. 720
Ohio Injector Co., The
Oliver United Filters, Inc.
Orr Felt & Blanket Co., The
Orton Crane & Shovel Co.
Owen Bucket Company, The 706
Paper & Industrial Appliances, Inc. 731
Paper Makers Chemical Dept. of Hercules Powder Company 648-649
Patterson Foundry & Mach. Co. 1st Cover
Peerless Pump Div., Food Machinery Corporation
Perkins & Son, Inc., B. F. 693
Permutit Company, The
Philco Corporation 729
Pittsburgh Piping & Equipment Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division 605
Poole Foundry & Machine Co. 729
Powell Company, The Wm. 721
Pusey & Jones Corp., The 617
Raymond Service, Inc., Charles P.
Reed-Prentice Corp.
Reichhold Chemicals, Inc. 633
Reliance Electric & Engr. Co. 631
Research Corporation
Rogers & Co., Samuel C.
Roofing Machinery Mfg. Co.
Roots-Connersville Blower Corp. 675
Ross Engineering Corp., J. O.
R-S Products Corporation
Ryerson & Son, Inc., Joseph T. 736
Sandusky Foundry & Machine Co.
Sandy Hill Iron & Brass Works, The 629
Shartle Bros. Machine Co. 677
Shuler & Benninghofen 679
Smith & Winchester Mfg. Co. 731
Solvay Sales Corporation 678
Spraying Systems Company 735
Sprout, Waldron & Co.
Standard Oil Co. (Indiana) 623
Steamaire Company
Stebbins Engr. & Mfg. Co. 628
Stein, Hall & Company, Inc.
Stickle Steam Specialties Co.
Sutherland Refiner Corporation 619
Swenson Evaporator Company 709
Taylor Forge & Pipe Works 671
Texas Company, The 638
Thomas Flexible Coupling Co. 723
Timken Roller Bearing Co., The 643
Titanium Pigment Corporation
Torrington Co., Bantam Bearings Division 711
Tewmotor Corporation
Trent Tube Manufacturing Co. 729
Trimbey Machine Works 727
Tube Turns, Inc.
Turner Halsey Company
U. S. A. Treasury Dept.
Union Pacific Railroad Company 681
United States Rubber Company
U. S. Stoneware Co. 626
Valley Iron Works Company
Vanderbilt Co., Inc., R. T.
Waldron Corporation, John 604
Warren Steam Pump Co., Inc. 686
Waterbury & Sons Co., H. 729
Waterbury Felt Co., The
Westinghouse Electric Corporation
Weyerhaeuser Timber Co.
Whiting Corporation 709
Whittaker, Clark & Daniels, Inc.
Wilkens-Anderson Company
Williams and Co., C. K. 718
Worthington Pump & Machinery Corporation
Wyandotte Chemicals Corporation
Youngstown Welding & Engineering Company, The

Now available at your mill office . . .

ready to serve in the maintenance and operation of your mill. A larger CATALOGUE SECTION with detailed information about the products of the prominent manufacturers that supply the industry. The cross-indexed BUYERS SERVICE SECTION to help you locate sources of purchases for machinery, equipment, chemicals and supplies. The ENGINEERS HANDBOOK extended for your use through the addition of a number of charts and tables.

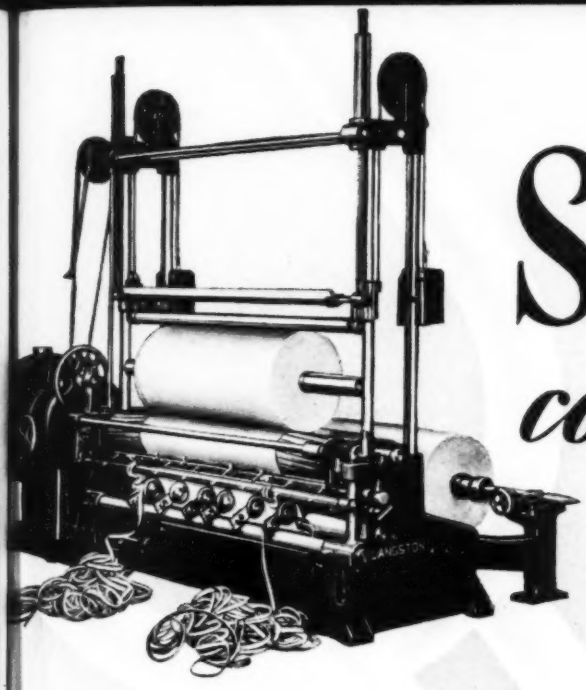
The PAPER AND PULP MILL CATALOGUE has been edited and produced to serve you. Use it frequently—the more you refer to it, the more helpful it will be to you.

These firms describe their products in the 1945-46 edition—

Allington & Curtis Mfg. Co., The
Allis-Chalmers Mfg. Company
American Cyanamid & Chemical Corporation
American Defibrator, Inc.
American Paper Mach'y. & Engr. Works, Inc.
Appleton Machine Co., The
Armour & Company
Armstrong Machine Works
Atkins & Company, E. C.
Aurora Pump Co.
Automatic Transportation Company
Bagley & Sewall Company, The
Bauer Bros. Company, The
Beloit Iron Works
Benjamin Electric Mfg. Co.
Biggs Boiler Works Company, The
Bird Machine Company
Black-Clawson Co., The
Blaw-Knox Division (Blaw-Knox Company)
Blickman, Inc., S.
Bowser, Incorporated
Buffalo Forge Company
Buffalo Pumps, Inc.
Bufovak Equipment Division (Blaw-Knox Company)
Cameron Machine Company
Carthage Machine Company
Cash Company, A. W.
Chemipulp Process, Inc.
Chicago Bridge & Iron Company
Chicago Electric Company
Clark-Aiken Company, The
Control Equipment Corporation
Covel-Manchett Company
DeBurik Shower Company
Dilts Machine Works
Dow Chemical Company, The
Downingtown Manufacturing Co.
Dresser Industries, Inc.
Duriron Company, Inc., The
English China Clays Sales Corporation
Falk Corporation, The
Farrel-Birmingham Company, Inc.
Fitchburg Screen Plate Company, Inc.
Fleishel Lumber Company
Foster Wheeler Corporation
Fuller Brush Company
Garlock Packing Company, The
General American Transportation Corporation
Glens Falls Machine Works, Inc.
Glidden Company, The
Golden-Anderson Valve Specialty Company
Goslin-Birmingham Manufacturing Co., Inc.
Graver Tank & Mfg. Co., Inc.
Gruendler Crusher & Pulverizer Co.
Harper Company, The H. M.,
Harris-Seybold-Potter Co.
Hauser-Stander Tank Co.
Hercules Powder Company, Inc.
Hermann Manufacturing Co., The
Hewitt Machine Company, Inc., J. W.
Hills-McCanna Co.
Holyoke Machine Company
Hooker Electrochemical Company
Improved Paper Machinery Corporation
Industrial Gear Mfg. Co.
Infico Inc.
James Manufacturing Co., D. O.
Jeffrey Manufacturing Co., The
Johns-Manville
Johnson & Carlson
Johnson Corporation, The
Jones & Sons Company, E. D.
Jones Foundry & Machine Co., W. A.
Kalamazoo Tank & Silo Company
Kohler System Company, The
Lancaster Iron Works, Inc.
Langston Company, Samuel M.
Lawrence Machine & Pump Corporation
Leader Iron Works, Inc.
Link-Belt Company
Lovejoy Flexible Coupling Co.
Market Forge Company
Mason-Neilan Regulator Co.
Maxson Automatic Machinery Company
Meisel Press Manufacturing Company
Merrick Scale Mfg. Co.
Michigan Pipe Company
Monsanto Chemical Company
Morris Machine Works
Moyno Pump Div., Robbins & Myers, Inc.
Murray Manufacturing Co., D. J.
National Aluminate Corporation
National Casein Sales
Naylor Pipe Company
Nekoosa Foundry & Machine Works, Inc.
Nichols Engineering & Research Corp.
Nobis & Wood Machine Co., The
Norma-Hoffmann Bearings Corporation
Northern Engineering Works
Norwood Engineering Company, The
Ohio Grease Company, The
Oliver United Filters, Inc.
Paper & Industrial Appliances, Inc.
Paper Makers Chemical Department (Hercules Powder Co., Inc.)
Pennsylvania Salt Manufacturing Co.
Perkins & Son, Inc., B. F.
Pittsburgh Piping & Equipment Co.
Porter Company, Inc., H. K.
Pusey & Jones Corporation, The
Record Foundry & Machine Company
Reichhold Chemicals, Inc.
Robbins & Myers, Inc.
Rollway Bearing Company, Inc.
Roots-Connersville Blower Corp.
Ross Engineering Corporation, J. O.
Sandusky Foundry & Machine Co.
Sandy Hill Iron & Brass Works, The
Scbutte & Koerting Company
Seybold Division, Harris-Seybold-Potter Co.
Shartle Bros. Machine Co.
Simonds Worden White Co.
Simpson Company, The Orville
Sinclair Company, The
Solvay Sales Corporation
Stainless Steel Division, Pittsburgh Piping & Equipment Co.
Stebbins Engineering & Manufacturing Company
Stein-Hall
Sullivan Machinery Company
Swenson Evaporator Company
Taylor Forge & Pipe Company
Toledo Scale Company
Trimbey Machine Works
Tube Turns, Inc.
Twin Disc Clutch Company
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Company
Waldron Corporation, John
Wallace & Tiernan Co., Inc.
Warren Steam Pump Company, Inc
Westinghouse Electric Corporation
Whiting Corporation

Please mention the PAPER AND PULP MILL CATALOGUE when making inquiries.

FRITZ PUBLICATIONS, Inc. 59 East Van Buren Street CHICAGO, ILLINOIS



Successful combinations

As a smooth-working team, the fife & drum have long been familiar symbols in our country's history. Another successful combination is the use of Langston's Type "AA" Slitter by The Texas Company in the preparation of saturated asbestos felt for distribution in connection with special uses.

All Langston Slitters and Roll Winders are heavily constructed with balanced drums and idlers to prevent vibration. Bearings, gears and all parts are proportioned to assure maximum service. Noted for exceptional performance with low maintenance costs, Langston Slitters will meet every need in Mill, Finishing Room or Converting Plant.

SAMUEL M. LANGSTON COMPANY, CAMDEN, N. J.

Langston

SLITTERS AND ROLL WINDERS

TEXACO

ELIMINATES SLOW DOWNS AND SHUTDOWNS

Due to Felts Filling Up

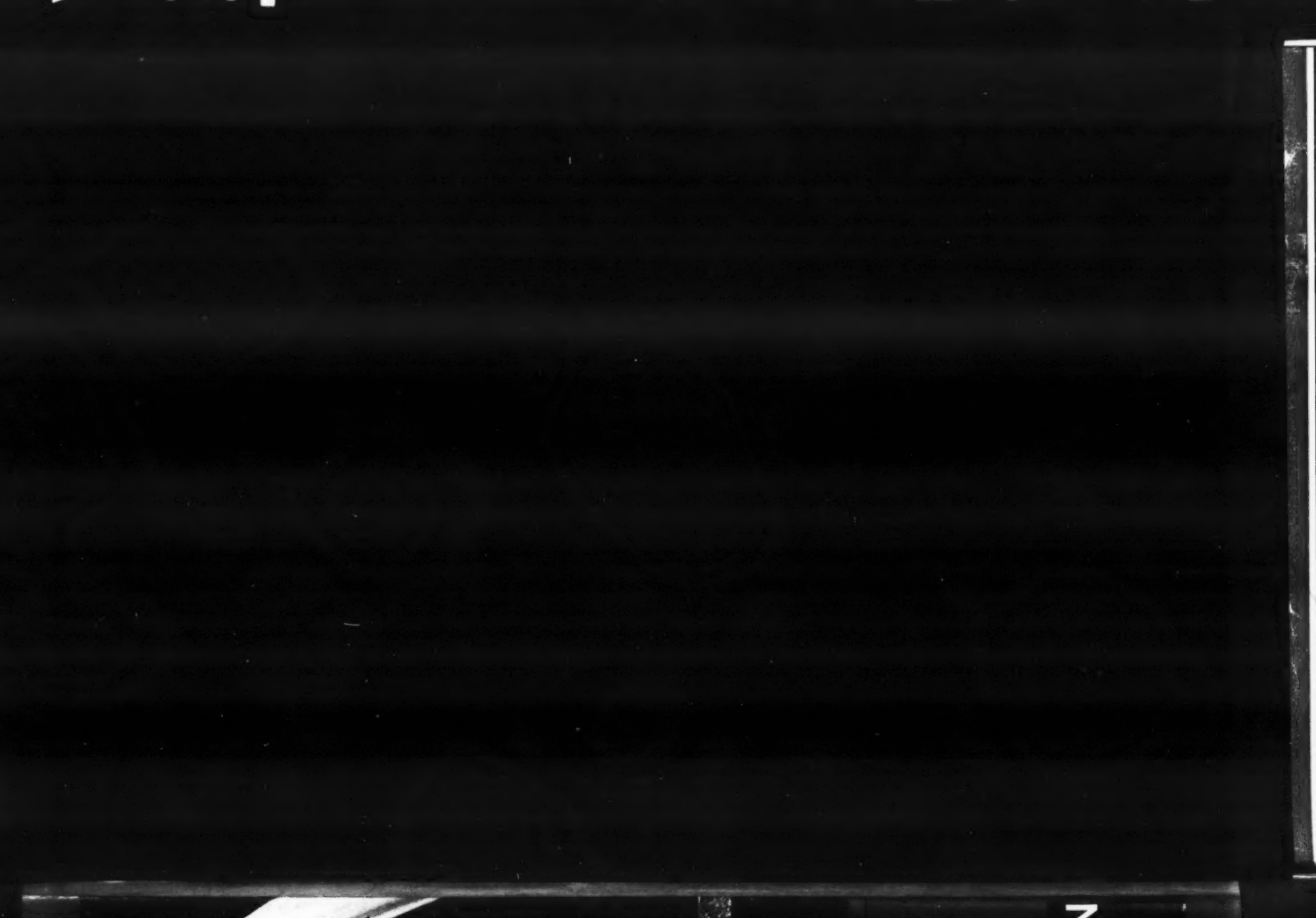
The Downingtown Suction Felt Roll continuously maintains the full width of press or pick-up felts clean and open at all times. This saves slowing down the machine as the felt fills up and eliminates frequent shutdowns for washing and roping. All this helps in maintaining production and quality. The roll is easily installed, often merely replacing a plain felt roll and it is unnecessary to remove the roll when changing felts. Over 200 now in use. Send for new catalog.

DOWNINGTOWN MFG. CO., DOWNINGTOWN, PA.

Installation on a cylinder board machine, pick-up felt.

D

Installation on machine making folding box and chip board.

DOWNINGTOWN

Designers & Builders
Paper Making Machinery